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Bachelor Thesis

Performance Measurement Systems for High Growth New Ventures in the Digital Age

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1.Introduction

This paper investigates the use of performance measurement systems (PMS) in high growth new ventures (HGNV). High growth new ventures have mostly been neglected in performance measurement systems research despite their positive effects for employment and economic growth (Bititci et al., 2012; Ates et al., 2013; Tan and Smyrnios, 2011; Birch et al., 1995).

In order to understand how high growth new ventures use performance measurement systems, this paper will provide a literature review on high growth new ventures, how to define HGNV, their benefit to the economy and job growth, their characteristics and their growth trajectories.

The next part will discuss recent entrepreneurship literature describing why a new venture experiences high growth. Therefore, the business model generation research stream will be investigated and the term startup will be defined and explained. Furthermore, this paper illustrates which stages a startup goes through before it experiences high growth, i.e. how a startup finds its “fit”.

The subsequent chapter will describe performance measurement systems. A brief historic overview will illustrate the evolution of PMS. Afterwards, the most prevalent PMS frameworks in research literature will be presented and analyzed on their applicability to high growth new ventures. Subsequently, recent trends in visualization are presented and the metrics used in PMS are discussed.

The author will use two case-firms to illustrate the adoption of PMS in expected high growth new ventures and use within-case-analysis and cross-case-analysis (Yin, 1981; Eisenhardt, 1989) to develop - in combination with previously demonstrated research findings - a performance measurement systems model for high growth new ventures in their respective stage.

As this paper was written in close collaboration with the research project BerlinStartupInsights at the Berlin School of Economics and Law, it concentrates on internet HGNV, while trying to illustrate similarities and differences to brick and mortar businesses¹.

¹ Brick and mortar businesses are defined as businesses that use a physical presence for their operations (e.g. retail stores).

2.High Growth New Ventures

High growth new ventures, also called gazelles have attracted increased attention due to findings that attribute positive effects for employment and economic growth to them (Autio, 2007; Saßmannshausen and Volkmann, 2012; Henrekson and Johansson, 2010). The term “gazelles” was coined by David L. Birch (1995) who defined gazelles as young ventures *“whose sales doubled every four years”*.

Birch is a renowned researcher in the field of job generation and is well known for his work *“The Job Generation Process”* in 1979. In this and subsequent works, he identified that a large share of net job creation is achieved by small firms. Birch’s methodology and statistical observation, however, were questioned and other research concluded no particular difference between small and large firms in the job creation process (Brown et al., 1990; Davis et al., 1996). Brown et al. (1990) discovered that *“small employers do not create a particularly impressive share of jobs in the economy, especially when we focus on jobs that are not short lived.”*

After this setback, further statistical observation with superior data assisted Birch, together with his previous adversaries Haggerty and Parsons, to discover that not small firms in general are responsible for the net job creation.

He identified a small subset of small firms, namely high growth small or new ventures that are responsible for a large share of new jobs. This specific subset was described by Birch as the *“Gazelles”* for their responsiveness, agility and adaptability.

In his work, Birch et al. (1995) distinguish between three different firm types: the mice, the gazelles and the elephants.

Mice are small firms with low growth and less than 20 employees. Gazelles are described as young firms with high growth rates. Different definitions of gazelles will be further explored in the next chapter. Elephants are very large companies that are inherently slow and inflexible and experience small to no growth (Birch et al., 1995).

2.1. Economic Relevance

The economic relevance of gazelles is depicted by Schumpeter (1934). In Schumpeter's early work, he describes the importance of entrepreneurial activity and innovation for the creation of new firms. Innovative and entrepreneurial new firms are able to destroy the existing market equilibrium and exploit the economic rent. This new formation facilitates technological innovation and efficiency improvements which in turn increase the economic output.

Since the formulation of Birch, the topic "*gazelles as the main job creators*" has attracted high interest and a multitude of researches has been carried out (Henrekson and Johansson, 2010; Acs and Mueller, 2007; Stangler, 2010). Most empiric findings support the view advocated by Birch and see gazelles as a major job creator, driver of innovation and economic growth (Haltiwanger et al., 2011; Autio, 2007).

This view was supported by Stangler (2010) who discovered that in the US "*the top five per cent of companies (measured by employment growth), or about 273,000 firms, create two-thirds of new jobs in any given year.*"

Although the effects on employment and economic growth are widely accepted, there is no agreed definition of gazelles which hinders researchers to compare various results and achieve a holistic understanding of the characteristics of gazelles (Wong et al., 2005).

2.2. Definitions of Gazelles

In the following part, ten definitions of gazelles from 1995 until 2010 will be presented.

Birch et al. (1995)	Enterprises whose sales doubled every four years
National Commission on Entrepreneurship (2001)	Employee growth of at least 15% in five consecutive years or at least 100% in five years
Stangler (2010)	At least 30% yearly revenue growth and/or at least 20% yearly employee growth over three years
Littunen and Tohmo (2003)	Enterprises that at least doubled their size in four years
Autio (2007), Global Entrepreneurship Monitor	Companies that employ at least 20 employees in five years' time
Moreno and Casillas (2000)	SME ² according to the definition of the EU, whose revenue grew by at least 100% in the last three to four years.
Acs and Mueller (2007)	Companies that are founded independently (no subsidiaries of existing firms) and employ at the start of the company already 20 to 499 employees
Lesonsky (2007)	Owner led enterprises that, independent of age and number of employees, generate 233.757 USD revenue per employee
Daunfeldt et al. (2010)	Enterprises that belong to the top one per cent in terms of revenue-, productivity- or employee-growth of one population
Davila, Foster and Jia (2010)	Independent enterprises that exist for no more than 10 years and have, depending on industry, 50 to 150 employees

Figure 1: Definitions of gazelles (based on Saßmannshausen and Volkmann, 2012)

These varying definitions show the diversified interest in gazelles and that no clear consensus on their characteristics has been reached (Autio, 2007; K. Mitusch and A. Schimke, 2011).

² According to the EU, small and medium sized enterprises (SME) are defined as enterprises which employ fewer than 250 persons and whose annual turnover does not exceed 50 million Euro and annual balance sheet total does not exceed 43 million Euro.

These definitions can be structured according to three different criteria, namely structural, quantitative and performance oriented criteria (Saßmannshausen and Volkmann, 2012).

According to the structural criterion, gazelles need to have at least one of the following four characteristics:

1. Owner led enterprise
2. Small or medium sized enterprise (SME)
3. Independent enterprise and/or
4. Newly founded or young enterprise

Most definitions do not take all characteristics into consideration and even though not explicitly mentioned, the fourth characteristic “newly founded or young” is often mentioned implicitly in publications (Saßmannshausen and Volkmann, 2012). This thesis perceives the fourth characteristic, newly founded or young enterprise, as the most important structural characteristic for gazelles.

For the quantitative criterion growth and size seem to be the major characteristics. Growth is mostly seen in terms of revenue or new employees with a threshold the enterprise needs to achieve for several or consecutive years.

Few definitions also include a performance oriented criterion such as revenue per employee (Lesonsky, 2007) or productivity growth compared to similar enterprises (Daunfeldt, 2010).

As the criteria are very different for these definitions, the absolute thresholds have high variances as well. Growth expectations vary from 20% to 100% per year for at least three to four years.

Current studies however have questioned in how far constant growth rates are normal for gazelles. As St-Jean et al. (2008) point out: *„[...] most of gazelles do not follow an unbroken or linear growth path. Research has shown that growth rates speed up, slow down or undergo more radical changes.”*

Furthermore, the possibility to define high growth new ventures only ex post and not ex ante reduces the possibilities to understand how HGNV cope with the challenges high growth entails (Davilla et al., 2010). Therefore, in this thesis the term “high growth new ventures” is expanded to firms experiencing or expecting high growth rates in the

present or near future. This is in line with Autio's (2007) who therefore defined expected gazelles as *"enterprises that want to employ at least 20 people after four years"* providing an ex ante definition for gazelles.

2.3. Characteristics of High Growth New Ventures (Gazelles)

After high growth new ventures have been defined, the question arises how these ventures are capable of growing so fast in different aspects.

A majority of entrepreneurship researchers conclude that innovation is a main driver of high growth for these new ventures (K. Mitusch and A. Schimke, 2011; Haltiwanger et al., 2011). This view is in line with Schumpeter's theory about the entrepreneur (1934):

"An entrepreneur is a person who is willing and able to convert a new idea or invention into a successful innovation."

Innovation in this respect can be either technological, organizational or market innovation.

Technological innovation is the type of innovation which has received the most interest by researchers and politicians. It is also considered to positively influence economic growth and productivity (Saßmannshausen and Volkmann, 2012; Ulrich *et al*; Mohr and Garnsey, 2011). The risk of a firm focusing on technological innovation is the costly innovation process and long duration until the innovation can be sold. However, as the profits can be very large if the invention does work, investors are willing to invest in these firms (Blank and Dorf, 2012).

Organizational innovation is created by companies which "break the rule" of certain industries. For example, Ikea created a way of using economies of scale in the furniture industry. Before Ikea's success, most furniture companies were small or medium sized and only produced small production runs. Costs of assembly were high and the assembled furniture was very large which led to high transportation and storage costs (Knyphausen-Aufsess et al., 2006).

Ikea revolutionized the furniture industry by building their large sales outlets out of town where real estate prices are low and leaving the assembly to the customer. In return, Ikea's furniture was much cheaper and could be taken home directly without waiting 4-6

weeks for delivery. For these benefits, customers were happy to assemble their furniture themselves – something which was not considered possible before - and in turn Ikea became the largest furniture maker in the world and its founder, Ingvar Kamprad, was ranked the 4th richest man in the world in 2009 (Forbes, 2013).

According to Knyphausen-Aufsess et al. (2006), breaking the rules “[...] *is often the way to exceed low margins of intensively competitive arenas*”. However, breaking rules is very risky and does not have to yield success. Therefore, great care needs to be taken when analyzing an industry and its rules in order to find alternative ways. Many of these alternative ways rely on untested hypotheses as there is no company which is currently operating this way and therefore no insights exist so far. Performance measurement systems can support the founder in his decision making process and opportunity identification process. This will be discussed at a later stage of this paper.

Market innovation concerns creating a new market by selling a product that did not exist before or selling it in a way that was not done before (Blank and Dorf, 2012). Firms identify a problem customer’s face and try to come up with a solution. This solution is then turned into a product and marketed. This type of innovation also involves high uncertainty and risks such as whether the problem actually exists for a sizable amount of people and whether they are willing to pay the targeted price for the solution.

High growth firms however have faced all these risks and uncertainties and prevailed for a certain time as high growth indicates that the value the firm offers is in demand.

High growth also leads to constant change of a company which quickly needs to adapt to a larger headcount that requires more processes and systems in order to implement strategy (Davila et al., 2010). This process of growing so quickly and not being able to change accordingly is also coined “*entrepreneurial crisis*” and seen as one factor why many high growth firms cannot keep these high-rates of growth up (St-Jean et al., 2008). This reorganization involves “*stepping away from everyday operations and concentrate on organizational change and market development*” (St-Jean et al., 2008) and “*switching to a more structured management approach and adopting management systems and processes in a timely way*” (Davila et al., 2010).

Not only internal processes and organization can change quickly but also external factors are rapidly changing for high growth new ventures (Autio, 2007). Therefore, HGNV still need to be able to recognize changing environments and quickly adapt to this change. Featherstone (2012) calls this need “*Adapt or die*”.

Lesonsky (2007) studied founders of high growth new ventures and considers them the “*crème de la crème*” of founders. Barkham et al. (1995) identified that they tend to be young, successful owners of multiple firms. In fact, he discovered that those who had several companies performed better. Furthermore, these founders are often members of professional organization and have a large professional network (Tan and Smyrnios, 2011).

Further criteria of high growth new ventures are mainly dependent on the industry and country of the new venture. The next part will further explore how startups become a high growth new venture.

3.From a Startup to a High Growth New Venture

Although high growth new ventures can only be defined ex post, there is a lot of new research on how to become a high growth new venture. As analyzed by Thomson (2006), generally a preparation phase exists before companies experience high growth (figure 2).

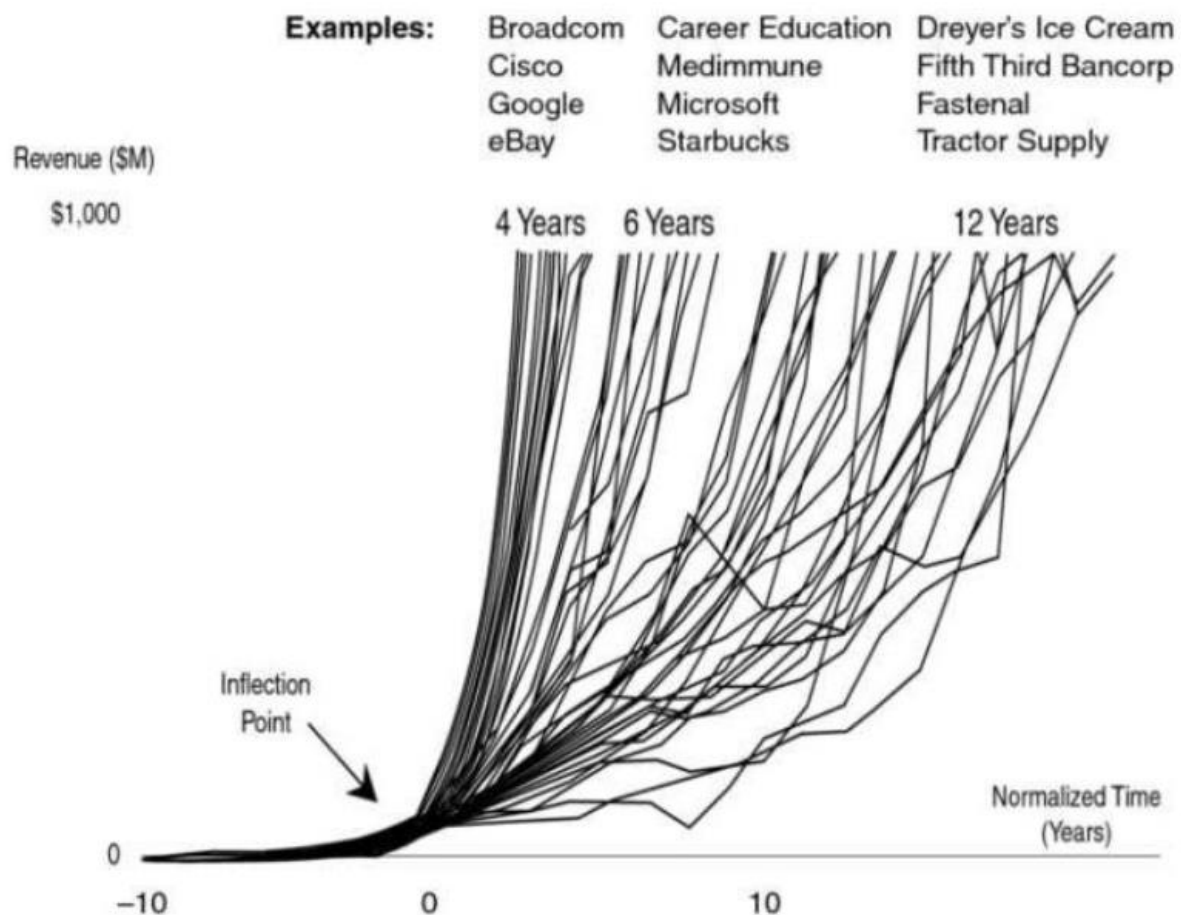


Figure 2: Revenue growth trajectories for high growth ventures (Thomson, 2006)

The above mentioned preparation phase is the time until the company starts to scale its business and has found the right “fit”. The period before this inflection point is different for most ventures. Some need many years to find their Product/Market Fit, while others find it rather quickly.

The time before the fit is described well by Block and MacMillan (1985):

“Starting a new business is essentially an experiment. Implicit in the experiment are a number of hypotheses (commonly called assumptions) that can be tested only by experience.”

This high amount of uncertainty leads to a high amount of risks and is one of the main reasons why so many newly founded businesses fail. High growth new ventures therefore are developed through an evolutionary process of learning until arriving at the promising inflection point which leads to an exponential growth trajectory.

A new venture that is in the preparation phase will be called a “*startup*” in this paper. The author draws on the definition of Blank (2013a) who defines a startups as “*a temporary organization in search of a scalable, repeatable, profitable business model.*”

How this evolutionary process can be managed and how some businesses are able to arrive at this stage while others never seem to find their “true” fit will be discussed in the subsequent chapter.

3.1. How to find the “*fit*”

The business plan has been the major planning tool of startups for a long time and is still requested by many investors today. Different studies have also shown that the existence of a business plan increases the likelihood that a company is actually founded (Heriot and Campbell, 2004) and has a positive impact on performance (Carland & Carland, 2003).

However, many scholars have questioned the benefits of a business plan recently. Ripsas et al. (2008) found no correlation between a good business plan - identified by winning a business plan competition - and the success of a company. Ripsas and Zumholtz (2011) questioned young ventures (12-42 months old) about their usage of the business plan. Their findings showed that young ventures mainly use the business plan as a means to gain funding and not as a tool for strategy and planning. Ripsas and Zumholtz (2011) therefore criticize the business plan as a rigid and time-intensive tool and call for more flexible and customer-oriented tools that concentrate on the business model thinking, quick learning and testing of different business models. Retrospecting on his business plan research, Ripsas (2013) called the business plan a “*failure-prevention-factor*”³ and states that he is more interested in finding success factors.

³ Englisch for *Misserfolgvermeidungsfaktor*. translated by the author.

Mullins and Komisar (2009) criticize the assumption of a business plan that everything is known up front. According to them, a business plan is based on a large number of untested hypotheses and falls apart if one hypothesis does not hold true.

“No plan ever survives its first encounter with the enemy.”

Douglas MacArthur

Maurya (2012) appreciates the business plan as a way to *“write down the initial vision of your business”* but complains that the business plan *“falls short of [...] facilitating conversation with people other than yourself”* and labels the effort that is put into writing a long business plan, which is based on hypotheses that are likely to be proven wrong, a *“form of waste”*.

In the past 15 years, the term “business model” introduced a new way to think and talk about companies and their strategy. A literature review conducted by Osterwalder (2005) showed that the term business model was just introduced in the late 1990s and by 2000 was recently mentioned in scholarly reviewed journals.

Year	In Title	In Abstract	In Keywords	in Full Text
2003	30	159	10	667
2002	22	109	2	617
2001	11	100	7	609
2000	16	67	1	491
1999	3	42	1	262
1998	1	19	0	128
1997	1	14	0	66

Figure 3: "Business Model" in peer reviewed journals (Osterwalder, 2004)

Chesbrough (2010) emphasizes the importance of the business model as a way to capture the value of an innovation. He concludes that a mediocre innovation with a great business model may be more valuable than a great innovation pursued with a mediocre business model.

Zott and Amit (2004) describe the business model as a structural template of how a focal firm transacts with customers, partners, and vendors; that is, how it chooses to connect with factor and product markets.

According to Osterwalder and Pigneur (pp.14, 2010) *“a business model describes the rationale of how an organization creates, delivers and captures value”*.

3.2. Business Model Design

The most prominent contribution of business model design was achieved by Osterwalder & Pigneur (2010). This model was called “a *proactive way to experiment with different models*” (Chesbrough, 2010) and is now used by various scholars in their customer development process (Blank and Dorf, 2012; Ries, 2011) and was adapted to suit different needs (Maurya, 2012).



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Customer segments: Defines the different groups of people or organizations an enterprise aims to reach and serve. The customers are the foundation of a profitable company. The business model must therefore be designed around their needs.

Value propositions: Describes the bundle of products and services that create value for a specific customer segment. The value proposition is the reason why customers choose one company over the other.

Channels: describes how a company communicates with and reaches its customer segment to deliver a value proposition. Communication, distribution, and sales channels comprise a company's interface with the customers. Finding the right mix of channels to satisfy how customers want to be reached is crucial in bringing a value proposition to the market.

Customer Relationships: Describes the types of relationships a company establishes with specific customer segments. Relationships can range from personal to automated. The customer relationships called for by a company's business model deeply influence the overall customer experience.

Revenue Streams: Represents the cash a company generates from each Customer Segment. If customers compromise the heart of a business model, Revenue Streams are its arteries. The revenue stream will be affected by the price the customer is willing to pay for the value provided by the company.

Key Resources: Describes the most important asset required to make the business model work. Different Key Resources are needed depending on the type of business model. Key resources can be owned or leased by the company or acquired from Key Partners.

Key Activities: Describes the most important things a company must do to make its business model work. Key activities differ depending on the business model type. They are the most important actions a company must take to operate successfully.

Key Partnerships: Describes the network of suppliers and partners that make the business model work. Companies create alliances to optimize their business models, reduce risk, or acquire resources.

Cost Structure: Describes all costs incurred to operate a business model. This building block describes the most important costs incurred while operating under a particular business model.

3.3. The Lean Startup Methodology

The Business Model Generation Process helps a startup to lay out its hypotheses in an organized way and proactively look for alternative business models (Chesbrough, 2010).

However, the business model canvas is only a static visualization that does not help the founder-manager understand whether certain aspects of the business model would actually work (Maurya, 2012; Ries, 2011).

In his publication “The Lean Startup” (2011), Ries incorporates the lean manufacturing principles into the business model generation process. The underlying principle of Lean Management is to avoid waste by optimizing resource expenditure (Womack et al., 1991).

Traditionally, waste is defined as everything that does not add value to the end customer. However, many young businesses do not fail because they are incapable of building a solution or creating value to customers but because they face too many uncertainties and have not found a sufficient number of prospective customers to offset the costs.

Therefore, Ries incorporates a new definition of value for startups which he calls “validated learning”. Validated learning is a process that turns leap of faith assumptions into facts through falsifiable hypotheses. This concept is reached with the help of the *Build-Measure-Learn-Loop* (Ries, 2011).

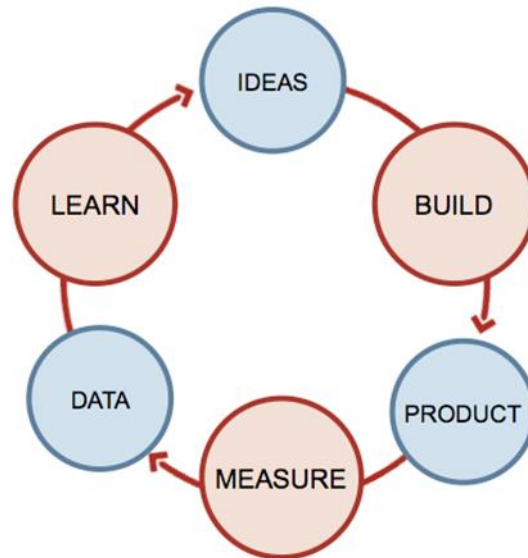


Figure 5: Build-Measure-Learn-Loop (Ries, 2011)

As written above, innovation and breaking the rule always involve a high amount of risk. The lean startup method designed by Ries (2011) minimizes the cost of eventual failure by minimizing development cost while still generating the required learning.

In order to combine high-learning with low costs, Ries developed the concept of a Minimum Viable Product (MVP).

"The minimum viable product is that version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort."

(Blank, 2013b)

The MVP should be built with the maximum amount of validated learning in mind. Therefore, the MVP is dependent on the hypotheses a startup wants to validate. Thus, MVPs can come in very different forms, ranging from a website, video, prototype or a scaled down version of the real product (Maurya, 2012).

Recently, practitioners and academics have proposed to use Kickstarter, a crowdfunding website, as an MVP (Herrman, 2012). The advantages include receiving extra funding by pre-selling the product at a very early stage and attracting a high

number of customers who have already invested in the product and are willing to contribute and promote the product. These customers are also called “*earlyvangelists*” (Blank and Dorf, 2012) - a combination of the terms “*early adopters*” and “*evangelists*”.

However, the use of Kickstarter limits the customer development process as the founders have promised to deliver a product which makes it much harder to pivot when realizing that some hypotheses turned out to be wrong.

The lean startup method incorporates the customer development model of Blank and combines it with agile development techniques. Agile development techniques are used to test the hypotheses defined in the customer discovery or validation process (Ries, 2011).

Despite its success and wide adoption, or because of it, the much appraised lean startup methodology and its MVP concept have recently been criticized. In his blog article “*Why Silicon Valley Funds Instagrams, Not Hyperloops⁴*”, Gangi (2013) criticizes the “*MVP obsession*” because the MVP’s success has reduced access to funding for companies that cannot develop an MVP. “*You only need an MVP if you’re trying to prove something. [...] it’s not a leap of faith at all — to say that if you have a safer, faster means of transportation people are going to use it*”.

However, investors currently favor the low-no risk investments with an MVP over the high risk, time intensive and large volume projects such as the Hyperloop.

3.4. Customer Development Model

Steve Blank (2005) developed the customer development model, a structured process that turns business model hypotheses, through continuous feedback from customers and structured testing, into facts. Blank criticizes the traditional product introduction model which does not include customer feedback until beta and does not accept failure.

The customer development model, in contrast, embraces failure as this is seen as the best way to learn and improve the business model.

In the customer development model, each step is represented as a circular track with a recursive arrow in order to highlight that startup development includes failure and often moving backward in order to test something again. Every step is organized according to

⁴ Hyperloop is a theoretical mode of high-speed transportation sketched out by Elon Musk.

the *Build-Measure-Learn-Loop* as described above. In a traditional product introduction plan moving backward is not acceptable. This leads to moving forward in the production process without having got the business model right.

The stages of a startup are represented by four separate steps: Customer Discovery, Customer Validation, Customer Creation and Company Building.

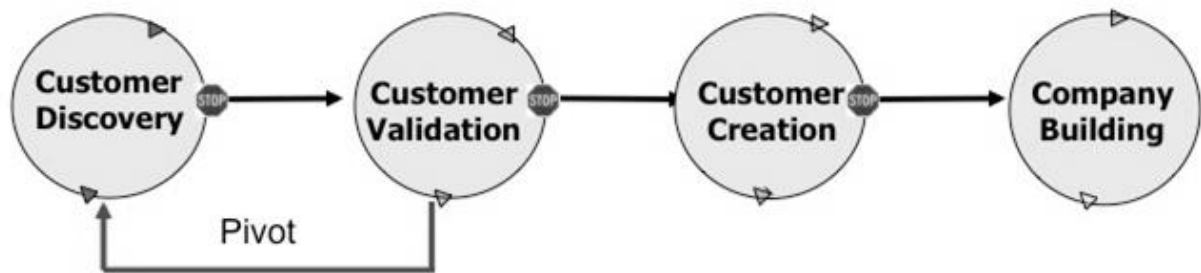


Figure 6: The customer development process (Blank and Dorf, 2012)

Startups only advance to the next step when they manage to “escape velocity”. A startup can escape velocity when it has “*enough measureable progress in finding the business model as defined by board and team*” (Blank, 2013a).

3.4.1. Customer Discovery

Customer discovery represents the first step in the customer development process. In the first phase of this step, the founder’s vision of the company is translated into hypotheses about each component of the business model and a set of experiments is used to test these hypotheses.

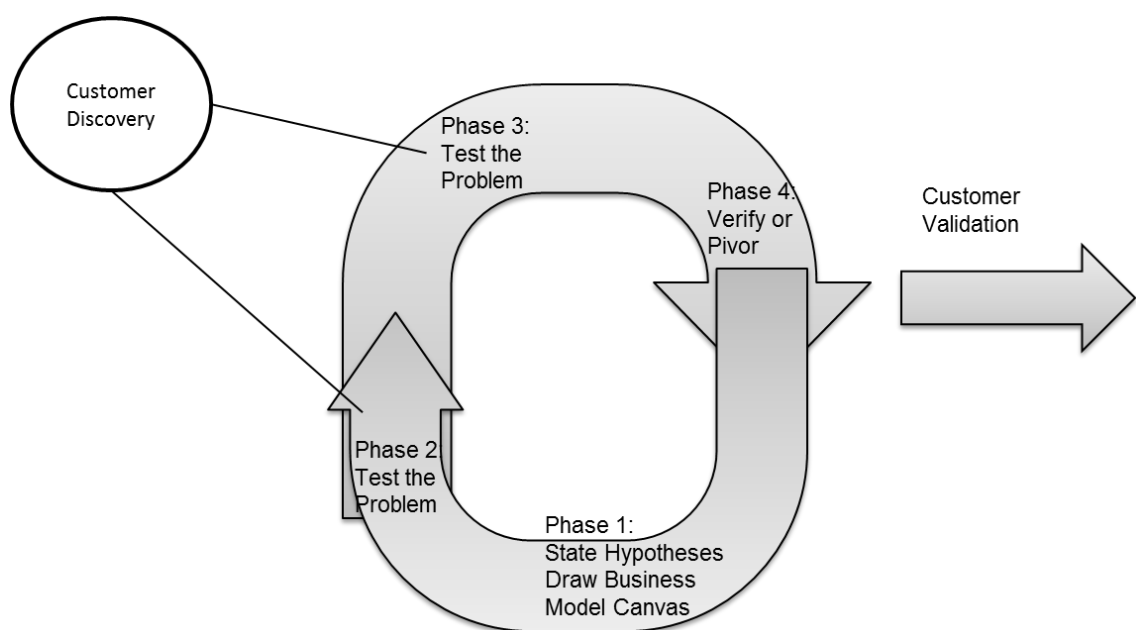


Figure 7: The customer discovery process (based on Blank and Dorf, 2012)

Blank and Dorf stress that in order to gain real insights and test their hypotheses, the founders need to get out of the building and gather early feedback from potential customers.

Customer Development Manifesto Rule No.1:

There are no facts inside your building so get outside.

Blank & Dorf 2012

In the next phase, the founders use qualitative interviews and different quantitative feedback techniques to verify that they understand the customers' actual problems and compare these to their hypotheses. The third phase focuses on validating the solution hypothesis.

After the problem and solution hypotheses are validated, the founders need to decide whether *"to pivot or preserve"*, i. e. proceed to the next stage as the hypotheses turned out to be true and the founders are positive that they found their "Problem/Solution Fit" or to go through the process again when additional learnings are required to fully understand the customers' problems and be able to present a viable solution.

3.4.2. Customer Validation

The customer validation step represents the second stage in the customer development process. This step involves a number of quantitative tests to determine whether the founders have found a product-market fit that proves that the *"business has a repeatable scalable business model that can deliver the volume of customer required to build a profitable company"* (Blank and Dorf, 2012).

During customer validation, the company's ability to scale and add customers should be tested. Blank and Dorf distinguish between "low-fidelity MVPs" that are used during customer discovery and "high-fidelity MVPs" that are used during customer validation.

The high-fidelity MVP is an actual product which focuses on the unique value proposition and should be enough for the customers to use while some features are still missing. Blank and Dorf's (2012) examples include a video game with only 5 of 20 levels or an online shoe store that only focuses on women casual shoes while providing a superb e-commerce experience.

These high-fidelity MVPs keep development costs and thus burn rates low while still helping the founders validate or falsify their hypotheses about the product and the customers' willingness to pay.

3.4.3. Customer Creation

In the customer creation stage the startup scales its sales and acquires as many profitable customers as possible. Heavy marketing and sales spending lead to high growth and success. These are the actions necessary to experience growth trajectories similar to these shown in figure 2 after the inflection point.

In this stage, the customer segments and all areas of the business model need to be fully defined and validated. This reduces risks and makes it easier to acquire the necessary funding to scale appropriately.

3.4.4. Company Building

A startup becomes a company concerned with executing the business model. Structured departments are needed and processes and the organizational structure need to be scaled to the appropriate size in order to cope with sales.

According to Blank, this is also often the time when the founder is not the right person to lead the company anymore. Operating executives are hired who overtake operations and grow the company steadily. This happens when founder realize that the company scaled "beyond their skillset".

3.5. Further Stage Models

This concept has received a wide array of respect especially for online startups which can develop and test new hypotheses generally easy. It has also been developed further by other entrepreneurship scholars such as Maurya (2012), Marmer et al. (2012) and Croll and Yoskovitz (2013). All of these scholars are proclaiming a process of constant iteration and innovation until data suggests that the startup has found its "fit".

Although all stage models share certain similarities, they differ in some sort. These differences will be illustrated subsequently.

3.5.1. Ash Maurya's Stage Model

In his book *“Running Lean”*, Maurya (2012) describes the startup stages as *Problem/Solution Fit*, *Product/Market Fit* and *Scale*.

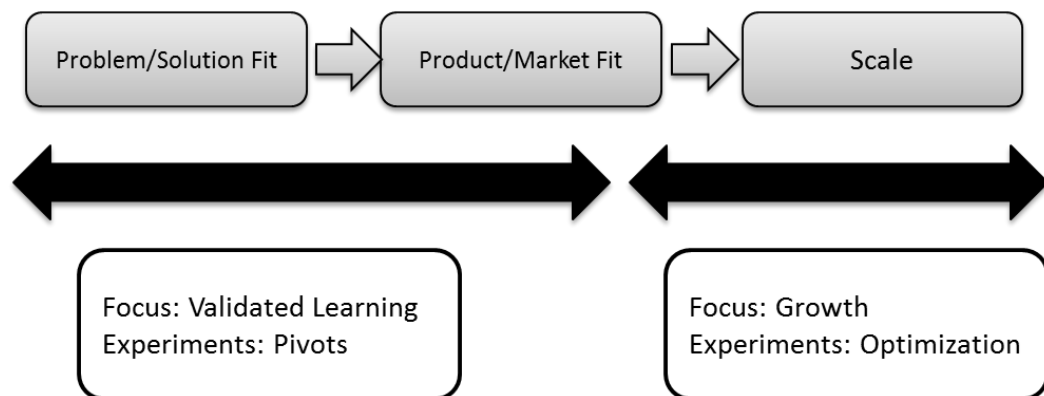


Figure 8: Ash Maurya's stage model (2012)

For Problem/Solution Fit the key question is: *“Do I have a problem worth solving?”* According to Maurya (2012), this can be determined with the help of three questions:

- *“Is it something customers want? (must have)”*
- *Will they pay for it? If not, who will? (viable)”*
- *Can it be solved? (feasible)”*

Similar to Blank, Maurya encourages founders to use customer feedback and interviewing techniques in order to identify whether the stated hypotheses can be validated or not.

To reach Product/Market Fit, the key question is: *“Have I built something people want?”*

To determine whether the startup found its Product/Market Fit, Maurya (2012) advocated using the *Sean-Ellis-Test*.

Sean Ellis designed a survey asking its customers the following question:

How would you feel if you could no longer use product X?

1. *Very disappointed*
2. *Somewhat disappointed*
3. *Not disappointed (It isn't really that useful)*
4. *N/A – I no longer use Product X*

Ellis identified, by using this survey for more than 100 startups, that when more than 40% of the users say they would be very disappointed without your product, chances

are high that you can build a sustainable, scalable business model. Startups below 40% always seemed to struggle (Ellis, 2010).

Differing from Blank, Maurya has only one further stage which he calls *Scale*. According to Maurya, company building is a process that is happening parallel to customer creation. The startup needs to grow its processes and headcount according to its sales output in order to keep up with the additional workload.

3.5.2. Startup Genome Project

Marmer et al. (2012) developed a startup stage framework based on Blank's concept of customer development and data from 3200 online-startups. They provide empiric evidence that consistent startups, i.e. startups that go through each stage after another, are in general more successful than inconsistent startups. Inconsistent startups generally scale prematurely and therefore burn resources and acquire customers without having found the appropriate problem-solution or product market fit.

Marmer et al. describe premature scaling in the following five different dimensions: customer, product, team, business model and financials. Signs of premature scaling are:

- *"Spending too much on customer acquisition before product/market fit and a repeatable scalable business model"*
- *Building a product without problem/solution fit*
- *Hiring too many people too early*
- *Raising too little money to get through the valley of death⁵*
- *Focusing too much on profit maximization too early*
- *Not adapting business model to a changing market"*

Marmer et al. (2011) defined six distinct stages: Discovery, Validation, Efficiency, Scale, Sustain and Conservation.

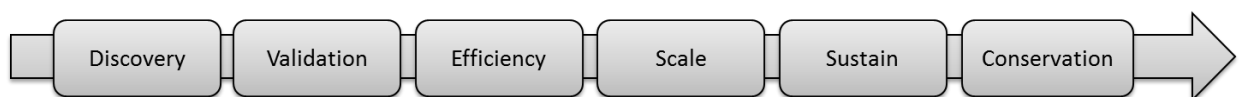


Figure 9: The Marmer Stages (based on Marmer, 2011)

⁵ The period of time from when a new venture receives initial funding to when it begins generating revenues (Investopedia, 2013).

Marmer et al. (2011) based their first four stages “loosely” on Blank’s customer development with being more product centric than company centric. The additional two stages emphasize the transition into a large company with lowering growth rates.

The first two stages (Discovery and Validation) do not need to be described much further as they don’t differ from Blanks design.

However, in contrast to Blank and Maurya, after having passed the validation stage, Marmer advocates that a startup should first concentrate on efficiency which means preparing the company for scaling its businesses. This could include implementing processes that can cater to mass production for manufacturer or optimize the customer acquisition channels and marketing activities (Marmer et al., 2011).

In the scale stage, a large funding round is conducted in order to obtain enough cash to acquire a high amount of customers and/or produce high quantities of products. Furthermore, personnel that are responsible for the execution of the plan made in the efficiency stage are employed.

3.6. The Difference Between a Startup and a Traditional Company

The previous chapter shows the different stages a high growth new venture progresses through in order to reach high growth trajectories. Although these stage models have some differences, there are strong similarities in both the process and tactics at these different stages.

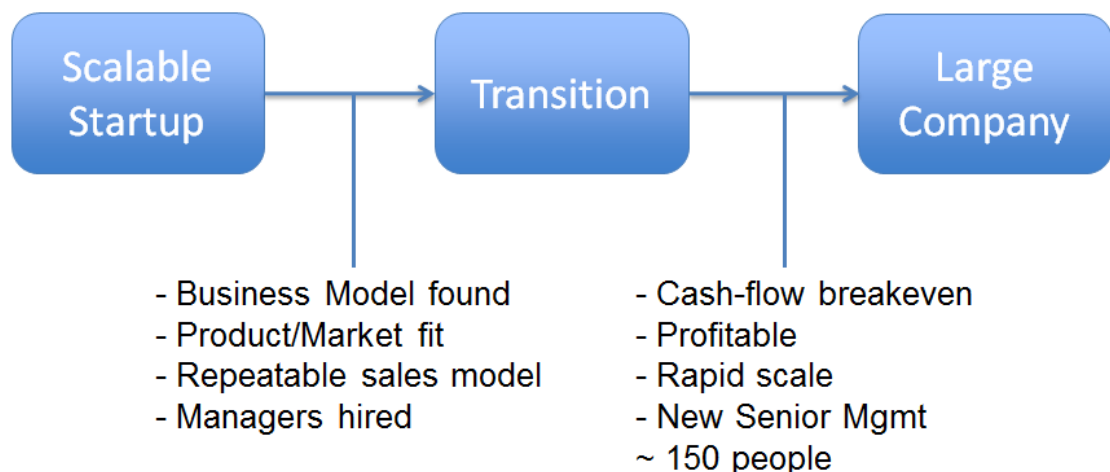


Figure 10: The startup development process (Blank, 2010)

While going through their growth stage, startups evolve from an organization searching for a business model to execute a business model. These changes imply a series of different goals, structures and also ways to measure and direct the company.

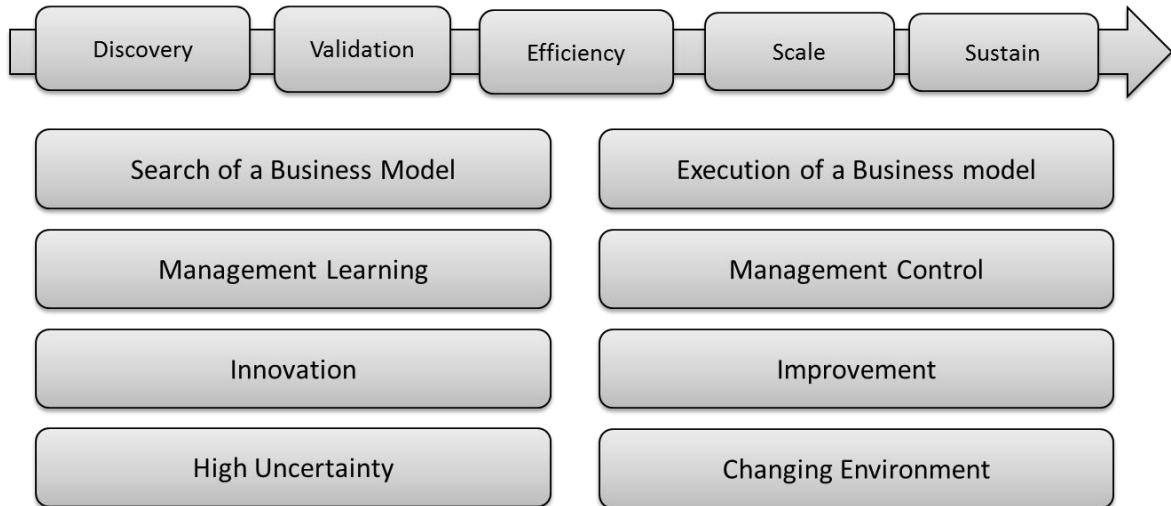


Figure 11: The Marmer stages and firm characteristics

For each part, a different way to measure performance is needed. In order to better understand how performance is measured, the next chapter will discuss performance measurement and the evolution of performance measurement systems.

4. Performance Measurement Systems

Performance measurement has attracted an intensive interest from many different research streams (Neely, 2005). Functional backgrounds include accounting operations management, finance, economics, psychology, sociology, entrepreneurship and marketing all have an interest in understanding performance measurement. However, due to this diverse nature of the research topic, no clear definition or theoretical background has been widely accepted.

The origins of performance measurement are seen by Johnson (1981) in the double entry bookkeeping which exists since the late 13th century. The performance measurement field evolved in the industrial age when various new production techniques such as the mass manufacturing models (Ford, 1922) or the specialization of labor (Taylor 1911) called for new ways to measure performance and control the

workforce. This need to better measure performance only increased with the emergence of large multinational corporations in the 1950s (Bititci et al., 2012).

The traditional concepts of performance measurement often emphasized financial indicators which provide limited use for the management and controlling of a company (Kaplan and Norton, 1992). Specifically criticized were the backward view, short-term perspective and the missing alignment with corporate strategy.

This criticism of traditional measurement systems led to a multiple of new, more balanced systems such as the performance measurement matrix (Keegan et al., 1989), the performance pyramid (Lynch and Cross, 1991), the results determinants framework (Fitzgerald et al. 1991) and the balanced scorecard (Kaplan and Norton, 1992) - arguably the most renowned performance measurement framework (Neely, 2005).

Especially the balanced scorecard has sparked an interest in performance measurement systems and led to a multiple of articles which addressed, among others, the implementation process (Hudson Smith and Smith, 2007; Ates et al., 2013; Bourne et al., 2003; Bisbe and Malagueño, 2012), the consequences (Dossi and Patelli, 2010; Franco-Santos et al., 2012; Gimbert et al., 2010; Fleming et al., 2009; Xiao et al., 2005) and the design of frameworks to further assess the quality of PMS (Keegan et al., 1989).

In the mid-2000s, Neely et al. (2002) criticized the predominance of the balanced scorecard approach in performance measurement literature and designed an alternative measurement framework called the performance prism which however did not receive comparable recognition as the balanced scorecard approach.

4.1. Defining Performance Measurement Systems

As previously stated, due to the highly diversified field of research, no common definition of performance measurement has been established to date. The following section will offer a review of the most prominent attempts to define performance measurement and come up with a definition which will be used as a basis for this thesis.

A widely accepted definition of performance measurement system is provided by Neely (2005) which describes PMS as follows:

*“A performance measurement system can be defined as the **set of metrics** used to **quantify** both the **efficiency** and **effectiveness** of **actions**.”*

Bisbe and Malagueno's (2012) definition provides a good overview of the important features of a PMS:

*“Performance measurement systems (PMS) are **concise sets of metrics** (which may be financial and/or nonfinancial, long and/or short term, internal and/or external, ex post and/or ex ante) that **support the decision-making processes** of an organisation by gathering, processing, and **analyzing quantified information** about its performance, and presenting it in the form of a **succinct overview**.”*

Similarly, Ittner et al. (2003) describe PMS as:

*“[...] systems that (1) **provide information** that allows the firm to **identify the strategies** offering the highest potential for **achieving the firm's objectives**, and (2) **align management processes**, such as target setting, decision-making, and performance evaluation, with the **achievement of the chosen strategic objectives**.”*

From these various definitions of PMS, one can draw certain key components of a PMS.

Performance measurement systems are a concise set of metrics which provide information that allow the firm to measure and analyze its efficiency and effectiveness of actions and its contribution to achieving the firm's objectives.

However, companies nowadays work in a highly competitive environment where competitive advantages are no longer sustainable (Schlälke et al., 2013). In this new environment and especially for young and fast growth firms, a new addition to performance measurement comes into play. Business analytics can supplement PMS by providing companies with new insights into business dynamics and their performance (Schlälke et al., 2013; Davenport, 2006)

Business analytics are a new way of gaining insights and competitive advantage by using the increasing amount of data to generate knowledge by combining logical reasoning with more complex statistical, mathematical and econometric models (analytical methods). Schlälke et al. (2013) therefore promote further research in the field of Performance Management Analytics (PMAs).

4.2. Performance Measurement Frameworks

The following section will discuss and describe the prevailing frameworks. The motivation to come up with new frameworks was - as explained before – the perceived need for a more balanced approach of measurement techniques which included not only financial measures but also non-financial measures.

The one predominant requirement that was agreed upon by many researchers in the field was that the PMS needs to be aligned with strategy in order to be successful (Neely, 2005; Kaplan and Norton, 1992; Keegan et al., 1989). Therefore, most researchers have tried to tie their frameworks closely to the firm's strategy. A second implication of this need is that there is no "one-size fits all" performance measurement system (Bititci et al., 2012; Franco-Santos et al., 2012) as strategy differs from organizations to organizations.

Further research could address a typology based approach that groups different business models according to their predominant characteristics and thus identifies their critical success factors. These critical success factors could then relate to performance measures that could give an indication on the measures that could be of importance to each type.

4.2.1. Performance Measurement Matrix

The performance measurement matrix was one of the first frameworks that gained widespread recognition. Keegan, Eiler and Jones (1989) categorized performance measures as being “cost” or “non-cost” and “internal” or “external”.

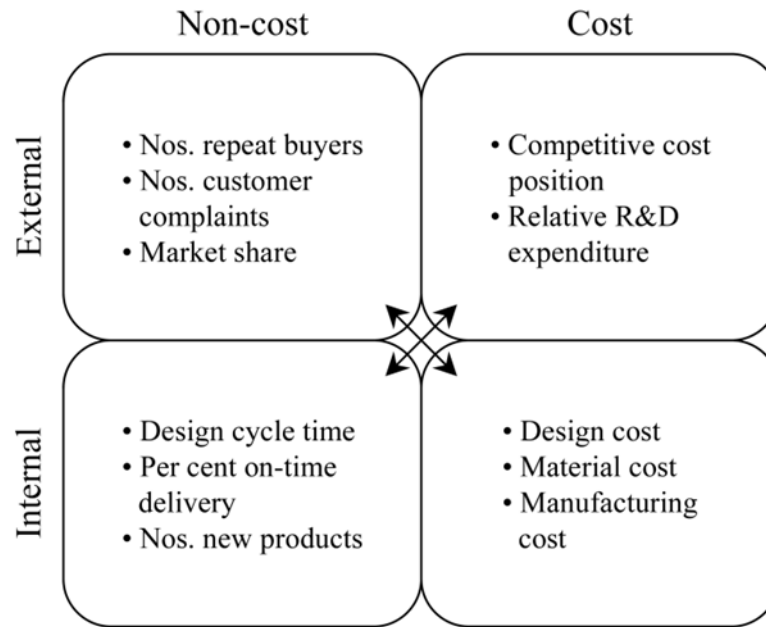


Figure 12: Performance Measurement Matrix (1989)

This framework reflects the need for a more balanced measurement system and its flexibility and simplicity made it easy for practitioners to use.

4.2.2. Performance Pyramid

The performance pyramid developed by Lynch and Cross (1991) also shows the need to use internally and externally focused measures. Furthermore, it emphasizes the cascading order of metrics starting with the corporate vision on the top and more specialized measures at the bottom. Another advantage in contrast to the performance measurement framework is that Lynch and Cross grouped measures into functional clusters which reduces simplicity but increases guidance and support for the implementation (Neely et al., 2007).

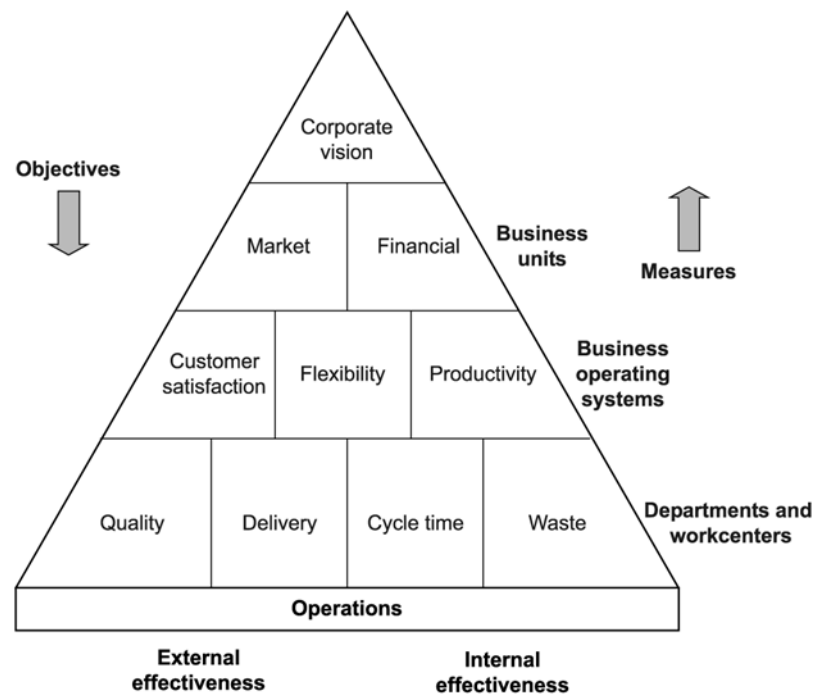


Figure 13: The Performance Pyramid (Lynch and Cross, 1991)

4.2.3. The Balanced Scorecard

The balanced scorecard is the most renowned performance measurement framework to date. Recent studies have shown that around 80% of all companies have adopted a kind of balanced scorecard (Neely et al., 2005). The performance literatures has been dominated by Kaplan and Norton's article about the balanced scorecard (1992) for the past 15 years (Neely, 2005).

The balanced scorecard consists of four different perspectives: (1) The customer perspective, (2) the financial perspective, (3) the internal business perspective and the (4) innovation and learning perspective.

The main point Kaplan and Norton (1992) stress is that each measure needs to be linked to strategy and support the strategic goals in a cause-and-effect relationship. Therefore, first goals need to be determined and afterwards the appropriate measures that conclude whether the goal has been reached or not are defined.

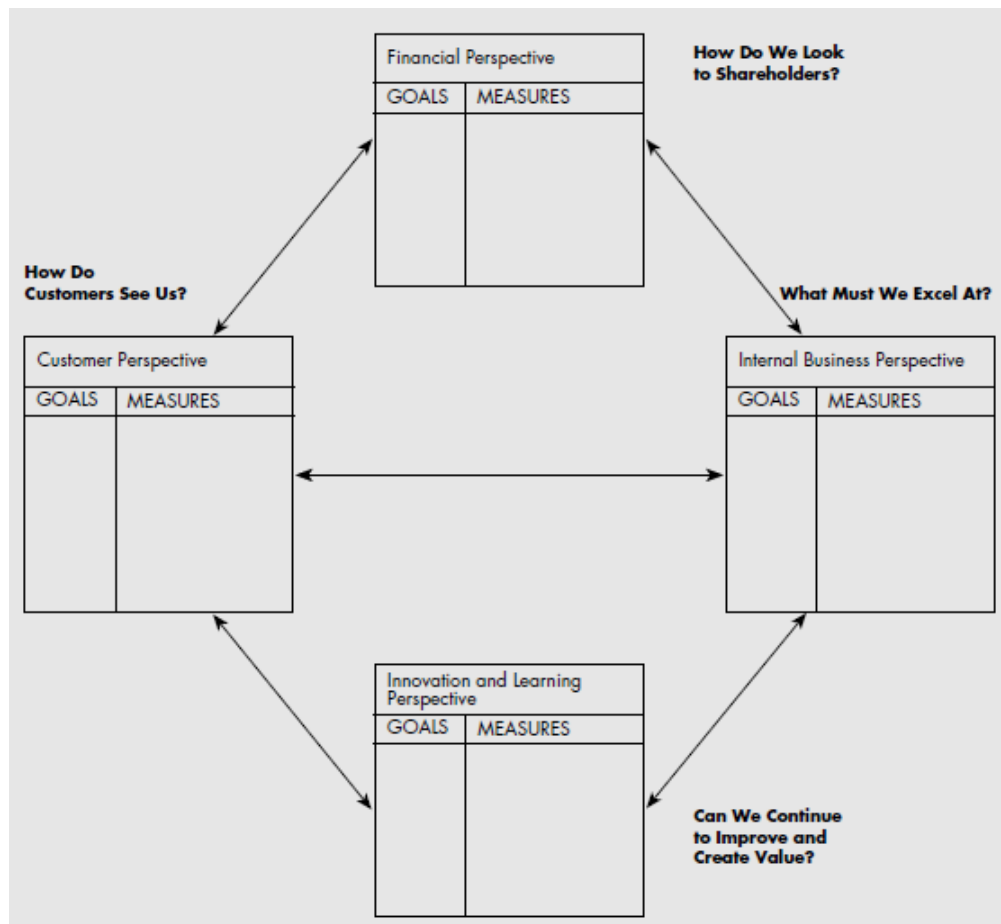


Figure 14: The Balanced Scorecard (Kaplan and Norton, 1992)

To help design the strategy and the required cause and effect relationships, Kaplan and Norton (2000) promote the strategy map that helps to link performance measures to strategy. The strategy map links all four perspectives to each other and to the company's strategy.

4.3. Visualization

"Startups don't starve, they drown."

Ries, 2011

The amount of data available to companies is higher than ever before (Allio, 2012). Even though young firms still face resource constraints, gathering data has become cheaper and easier through continuous advancements in information and communication technologies (Yigitbasioglu and Velcu, 2012). Nowadays, the customer's journey and buying behavior can easily be tracked on the internet.

This large amount of data does not translate into insights without additional help and many managers seem overwhelmed by the amount of data available. Excessive information may even lead to decision inaccuracy:

“ Shields (1983) and Iselin (1988) found an inverted U-relationship between the accuracy of decision-making and the quantity of information supplied. The inverted U-relationship indicates that there is a certain level of accounting information supplied in reports that results in the most accurate decisions.”

(Yigitbasioglu and Velcu, 2012)

Thus, the need emerged to a) define the relevant and actionable data and b) visualize the data in a form that the owner-manager can easily understand and analyze the main metrics of his/her business (Pauwels et al., 2009).

The trend to visualization is also apparent in the business sector with many business intelligence companies adopting visualization functionalities (IBM, Magic Quadrant).

One approach to handling the information overload with the help of visualization is the use of a dashboard. A dashboard is a high-level overview of the relevant metrics preferably showable on one page or screen with which the manager gets an immediate impression of the business condition (Ganapati, 2011; Stoller, 2010).

Especially the entrepreneurship scholars have heavily advocated the use of a dashboard (Ries, 2011; Mullins and Komisar, 2009; Maurya, 2012).

4.4. Metrics used in Performance Measurement Systems

The metrics used in a performance measurement system are the most important part of the whole system. Although there is a wide array of literature concerning the implementation of PMS and the design of PMS, the right metrics have to be used in order to gain valuable insight that can lead to actions.

The majority of performance measurement researchers agree that there cannot be “one size fits all metrics” as these metrics need to be aligned with strategy. The metrics thus depend on the business model, size, age, market and finance structure of the business.

Due to the high complexity and differing kind of metrics, this thesis supplies an overview of the most used metrics which are organized into the following three distinct categories: *Financial Metrics*, *Customer Metrics* and *Operational Metrics*. The usage and adoption of metrics will be analyzed based on a review of the performance measurement literature, the entrepreneurship literature and insights gained from entrepreneurs, investors and scholars during the BerlinStartupInsights “*Expertenworkshop*”.

4.4.1. Customer Metrics

Two of the most prominent proponents of customer metrics for strategic use were Kaplan & Norton (1992) who included a customer category into their balanced scorecard.

Especially in management accounting (MA) and also in performance measurement, customer metrics were not treated equally important to financial metrics. Problems to quantify results and the unclear influence on bottom line financial success are reasons for this occurrence. Bates and Whittington (2009) reviewed 18 MA texts without finding a single one covering aspects of customer profitability analysis (CPA) or customer lifetime value (CLV).

As the previously stated entrepreneurial concepts (Blank and Dorf, 2012; Ries, 2011) have already implied, customer insights play a very important role in both the search and execution of a business model.

The wide adoption of the internet furthermore increased the possibilities to track and analyze customer data manifold. Internet businesses are nowadays able to track distinctive customer actions, know where the customer moves his/her mouse cursor and are aware whether a customer is a recurring or new. The evolution from customer satisfaction surveys, which have not lost their importance, to in-depth customer insights and profiles has drastically increased the usefulness of customer metrics.

Besides metrics concerning customer actions, concepts like the CLV combine customer information with financial indicators leading to further insights.

Especially in early stage startups, customer metrics help founders to determine how satisfied customers are with the product and whether the company is moving forward (Croll & Yoskovitz, 2013).

Customer Satisfaction

Customer satisfaction has been seen as a central customer metric (Kaplan and Norton, 1992) and research that concentrated on non-financial performance measures often included customer satisfaction (Matook, 2013; Chenhall and Langfield-Smith, 2007; DeBusk et al., 2003). Furthermore, research has identified that customer satisfaction was the key customer metric for large and multinational companies (Maltz et al., 2003; Dossi and Patelli, 2010).

Marketing scholars have recently criticized the wide adoption of customer satisfaction for its backward-looking characteristic and its unobservable nature (Gupta and Zeithaml, 2006). Petersen et al. (2009) describe the problems with customer satisfaction as follows:

“For example, when firms measure customer satisfaction, by the time the data is received and analysed, it reflects yesterday’s perceptions of satisfaction. It also does not include any information about competitors’ actions or potential customer prospects. All of these factors cause customer satisfaction to be a less than adequate predictor of future customer behaviour or firm performance.”

Alternative measures of customer satisfaction such as retention, viral coefficient or customer lifetime value are seen as observable customer metrics with a high correlation to customer satisfaction and forward-looking characteristics (Gupta and Zeithaml, 2006; Petersen et al., 2009).

Pirate Metrics

Entrepreneur and founder of the business incubator “500 startups”, Dave McClure, developed a concept that is similar to a traditional sales funnel that gives an overview of the steps a typical customer will go through. The first letters of McClure’s concept (Acquisition, Activation, Retention, Revenue, Referral) put together say “AARRR” which said loudly sounds like the battle cry of a pirate. Therefore, McClure coined this concept the pirate metrics or AARRR-funnel.



Figure 15: AARRR-Funnel (McClure, 2009)

McClure and other scholars advocate that tracking and reviewing these metrics help founders to understand which part of their product works well and how changes to their product affect performance. A special emphasize concerning the pirate metrics does not concern absolute numbers but conversion rates. A conversion rate is the percentage of users who undertake the next action. These conversion rates can be calculated for every step and also for the complete funnel.

Although conversion rate is considered an internet marketing metric, it generally is applicable to most brick and mortar businesses as well (McClure, 2009). Differentiating between the people who visit the retail store, those who try something on and those who buy a product can help the retail store to define where it is losing potential customers and improve these parts. This concept however is much more resource intensive for brick and mortar businesses than for e-businesses.

These customer metrics have also been advocated by different marketing and performance measurement scholars (Ittner and Larcker, 2003; Petersen et al., 2009). Particularly retention is seen as a key metric because it implies that customers like the product.

Customer Lifetime Value

The customer lifetime value (CLV) is a prediction of the net- or gross-profit of a customer for the entire future relationship. The CLV can be calculated with varying

levels of sophistication. As it is based on the present value of the future cash-flows, the CLV cannot be calculated with complete certainty but includes assumptions on the future relationship with the customer (Gupta and Zeithaml, 2006).

The churn rate, the percentage of customers who end their relationship with the company in the given period, is used to calculate the CLV. From the churn rate, the average customer relationship time can be calculated which multiplied by the contribution margin results in the CLV.

$$CLV = \frac{\text{Average Monthly Revenue per Customer} * \text{Margin per Customer}}{\text{Monthly Churn Rate}}$$

The CLV is used to identify profitable customers in order to specifically target customers with a high CLV. Furthermore, the level of the CLV determines the level a company can spend to acquire new customers, so called **customer acquisition cost**.

These metrics among others are grouped under the term “customer profitability analysis” (CPA), which is also described as activity-based-costing (ABC) on a customer basis (Petersen et al., 2009; Ambler and Roberts, 2007). So far, traditional management accounting research field has not embraced this research field and another field has formed called “strategic management accounting” (SMA). Scholars advocate that MA does not facilitate decision making.

Referral Metrics

The term “viral marketing” was coined by the venture capital firm Draper Fisher Jurvetson in order to describe network assisted word of mouth (Croll and Yoskovitz, 2013). The concept of word of mouth, i.e. the impact of customers recommending a product to friends and family, was analysed by Bass (1969) who discovered that word of mouth leads to an S-shaped growth trajectory, called the “Bass diffusion curve”.

Net Promoter Score

The net promoter score (NPS) developed by Reichheld (2010) describes the probability of word of mouth. NPS is based on a direct question: *How likely are you to recommend our company/product/service to your friends and colleagues?* The scoring for this answer is most often based on a 0 to 10 scale (Reichheld, 2010). Customers who

choose a 9 or 10 are considered promoters, customers who choose a 7 or 8 are passively satisfied and those who choose 0-6 are detractors. The percentage of net promoters is calculated by subtracting the percentage of detractors from the percentage of promoters.

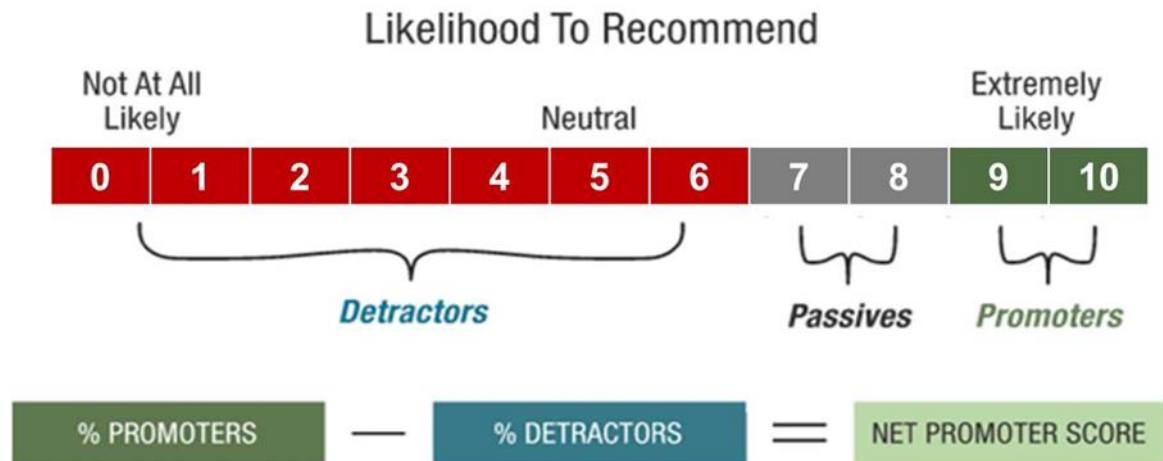


Figure 16: The Net Promoter Score (Darika, 2012)

Reichheld described this metric as the “one measure you need to grow”, suggesting that it is the key driver of business growth (Petersen et al., 2009). This assumption has received quantitative support as Hogan et al. (2003) were able to show that company value declines when a customer disadopts. This was partly explained by the lost purchases but also by the lost word of mouth causing losses of potential future sales.

Furthermore, Villanueva et al. (2008) found out that customers acquired through word of mouth give more than double of the profit than customers acquired through short-term advertising or promotions.

E-businesses are able to measure word of mouth electronically via the **viral coefficient** which venture capitalist David Skok (2009) defines as “*the number of new customers that each existing customer is able to successfully convert.*”

Croll & Yoskovitz (2010) describe the way to measure the viral coefficient:

“To calculate your viral coefficient:

- 1. First calculate the invitation rate, which is the number of invites sent divided by the number of users you have.*
- 2. Then calculate the acceptance rate, which is the number of signups or enrollments divided by the number of invites.*

3. *Then multiply the two together.”*

Probability to recommend can also be seen as an alternative way of measuring customer satisfaction.

4.4.2. Financial Metrics

This paper and the predominant literature in PMS and entrepreneurship have advocated the importance of non-financial measures and criticized financial measures for their inadequacies, their backward looking focus and their inability to reflect contemporary value-creating actions (Keegan et al., 1989; Kaplan and Norton, 1992; Ittner et al., 2003; Neely, 2005; Micheli and Manzoni, 2010; Dossi and Patelli, 2010; Bisbe and Malagueño, 2012).

However, Kaplan & Norton (1992) and other scholars still accept the financial measures' important role for performance measurement:

“Periodic financial statements remind executives that improved quality, response time or new products benefit the company only when they are translated into improved sales and market share, reduced operating expenses or higher turnover.”

The financial metrics discussed in the performance measurement literature and management accounting literature are based upon the profit & loss statement and the balance sheet. When reviewing their findings of financial metrics in performance measurement systems, Maltz et al. (2003) concluded:

“There were no major surprises in the most common financial measures. Sales, profit margin, revenue growth, cash flow, and net operating income were the most important measures as seen by the respondents and were widely used in academic research.”

Furthermore, return on investment (ROI) and return on equity (ROE) were also used by 50% of all questioned companies. Albeit being lower than the +80% adoption rates of the other financial metrics, these metrics have gained wide acceptance in MA textbooks and PMS literature as such (Drury, 2008).

For small and/or young companies cash flow, liquidity, burn rate and time to run out of cash are important financial metrics in order to understand how much they can invest and how long they can accept to be unprofitable in order to expand or improve their offerings (Tan and Smyrniotis, 2011; Maltz et al., 2003). This was also mentioned by all

four startups that were analyzed in the “*Expertenworkshop*” conducted by BerlinStartupInsights.

In their analysis of fast growth SME, Tan and Smyrniotis (2011) describe their findings towards financial measures as follows:

“Cash, rather than the maintenance of a smooth cash flow from profit is an important indicator to owner-managers whose objectives are to stay in business (Jarvis, Curran, Kitching and Geoffrey, 2000).”

This again emphasizes the close interrelation between objective and metric. The following table offers a short definition of the previously mentioned financial metrics.

Financial Metrics	Description
Sales	The amount of services sold.
Profit	The difference between the purchase and the component costs of delivered goods and/or services and any operating or other expenses.
Contribution margin	The marginal profit per unit sale. Contribution Margin = Unit Revenue – Unit Variable Cost
Revenue growth	$\text{Revenue Growth} = \frac{\text{Revenue}}{\text{Last months revenue}} - 1 * 100$
Operating income	Measures of a firm’s profit that exclude non-operating actions such as interest and tax expenses Operating income = Revenue – Operating expenses
Return on investment (ROI)	A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. $\text{ROI} = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$
Return on equity	The amount of net income returned as a percentage of shareholders’ equity. $\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder’s Equity}}$
Cash	Legal tender or coins that can be used in exchange goods, debt, or services.
Burn rate	Amount of cash spent per month.

Cash Zero Date	$\text{Cash Zero Date} = \frac{\text{Cash}}{\text{monthly burn rate}}$
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Figure 17: Definition of relevant financial metrics (based on investopedia)

4.4.3. Operational Metrics

Operational metrics are very dependent on the value adding process of the business and have therefore been only vaguely described and analyzed in academic literature (Tan and Smyrniotis, 2011).

These metrics are especially important for businesses in manufacturing industries as their costs are largely dependent on the efficiency of the manufacturing process. Businesses in service industries with a very repetitive process can also use metrics to improve this process.

Operational metrics are derived from the key processes a firm undertakes in order to create, capture and deliver value (Osterwalder and Pigneur, 2011; Kaplan and Norton, 1992). Due to the absence of generally accepted operational metrics, this thesis will describe three firms and their operational measures drawn from the PMS literature.

Hudson Smith and Smith (2007) investigated the implementation of a PMS at a manufacturer for propeller of luxury yachts employing 150 employees. This company identified delivery performance and resource utilization as the main KPIs. This shows that the most important process for creating, capturing and delivering value for this company was the timely production in order to not dissatisfy customers (Hudson Smith and Smith, 2007). The second KPI, resource utilization, emphasizes the importance of cost-efficient production for production companies in order to keep prices competitive while maintaining margins.

Hewlett-Packard uses breakeven time (BET) to measure the effectiveness of the development cycle. BET measures the time needed to recoup all accumulated expenses that incurred in the product development stage by the product's contribution margin (Kaplan and Norton, 1992).

Blinkist is a berlin based startup that translates non-fiction books into comprehensive, concise, specified for mobile reading summaries called "blinks" that you can read in 15 minutes to get the "gist" of the book. This startup measures the number of sold blinks per employee per month so that they are able to "*allocate resources effectively*" (BerlinStartupInsights, 2013).

5. Case Study

As this research field is still in its evolvement stage, the most appropriate research approach was deemed to be the case study method. A large amount of empirical and quantitative research has been conducted on performance measurement systems for large firms (Maltz et al., 2003; Dossi and Patelli, 2010; Fleming et al., 2009).

Empiric research concerning high growth new ventures is scarce (Tan and Smyrnios, 2011) and therefore an attempt to develop theory needs to be undertaken before theory can be validated quantitatively (Eisenhardt, 1989; Yin, 1981).

Yin (1989) defines a case study like this:

“Case studies investigate a contemporary phenomenon within its real life context when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used. Both single or multiple cases can be studied.”

In social science and business research, the case study method has become an essential form of research being used in multiple contexts throughout the last decades (Chetty, 1996). Based on the literature review an interview guideline was developed and semi-structured interviews were conducted. Semi-structured interviews help the researcher to understand the participants' reasoning and adapt to his answers in order to comprehend the underlying motives (Eisenhardt, 1989).

The weaknesses of case study analysis and the use of semi-structured interviews have also been highlighted in the literature. Case study theory building can lead to narrow and idiosyncratic theory due to its bottom-up approach and the generalization of specific data (Eisenhardt, 1989). Furthermore, Denscombe (2007) demonstrated that people respond differently to the same answers depending on how they perceive the interviewer. This is called the “interviewer effect”. Furthermore, researchers have observed that interviewees respond the way they think the situation requires them to, also called “demand characteristics” (Gromm, 2004), or what they expect would reflect positive on them, also called “social desirability bias” (Mitchell and Joley, 2007).

However, the strengths of the case study approach in gaining a deeper understanding of a previously less studied phenomenon led to the decision to use a case study approach for this thesis.

Two firms were selected for further investigation, namely Spotistic and Salonmeister. Both companies offer a Software-as-a-service (Saas) for businesses however with differing value proposition and for different customer segments. Spotistic is still searching for its product market fit while Salonmeister is currently concerned with growth. After a within-case analysis that describes each firm's business model, its use of performance measurement systems and strategies, a cross-case analysis is conducted that tries to identify differences in their use of performance measures that can be attributed to their different startup stages. The combination of within-case analysis with cross-case analysis has been advocated by the two predominant case study researchers Yin (1981) and Eisenhardt (1989).

For both firms, existing data and information was analyzed and interviews with one of the founders were conducted. The author acknowledges the value of triangulation and mixed methods design which uses quantitative data to test theory drawn from qualitative data. However, due to resource constraints, this paper will concentrate on developing theory which can be tested in subsequent research engagements.

5.1. Spotistic

Spotistic is a local marketing Saas-provider that aggregates and digests data from a multitude of location-based services. Spotistic provides customers with a dashboard which supports them to keep track of their customer interactions on platforms such as Foursquare, Facebook places, Yelp and Twitter. Furthermore, Spotistic provides actionable metrics with the help of a venue score and feedback topic to understand what users like or dislike about the venue.

The two engineering graduates, Victor Landau and Maxence Decrosse, started developing Spotistic in April 2012 and officially launched Spotistic in September 2012 when being admitted to the accelerator programme "Startupbootcamp". Startupbootcamp is a three-month long Europe based accelerator programme that focuses on exposing and connecting startups to an expanding network of top-level mentors and advisors.

Danny Holtschke, a business graduate from the University of Maastricht and BSEL, joined Spotistic in October 2012 as COO. Spotistic consists of three founders and three interns and has been working on finding problem/solution fit in the last year. By August,

2013 Spotistic received Exist-funding, claims to have found Problem/Solution Fit and is now working on product-market fit.

To incorporate entrepreneurship methodology, the business model of Spotistic is visualized in a business model canvas.

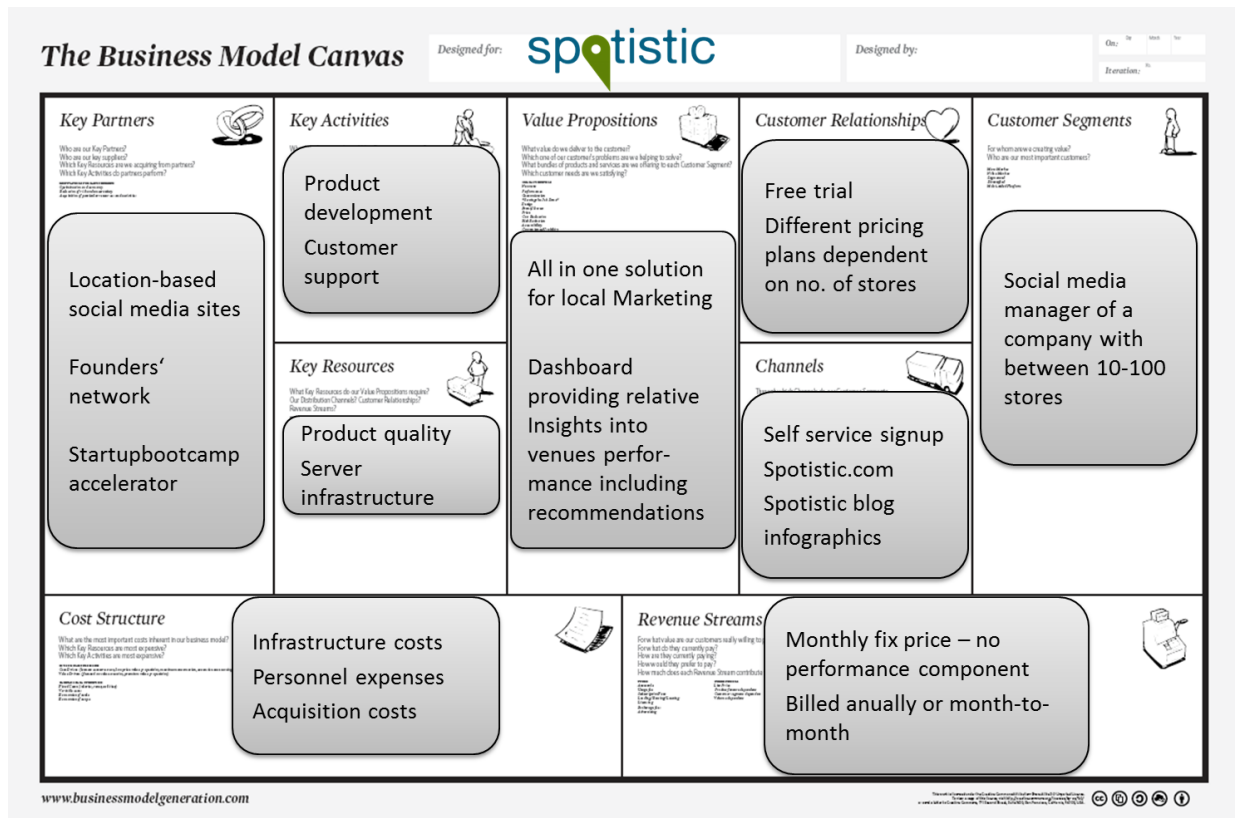


Figure 18: Business model Canvas of spotistic

Danny Holtschke states that metrics are an integral way of tracking progress. The key objective for Holtschke and his colleagues for the upcoming year is finding Product/Market fit. He states that different aspects of the business of Spotistic require different strategies. The different aspects are fundraising, product development and customer development. After one major objective - in this case fundraising - has been achieved, the founders want to formalize their business strategy for the year 2014 in September 2013. So far, Holtschke says: *“we have an idea of where we want to go and many hypotheses we need to validate but we did not define concretely whether to go left or right. [...] But I want to come up with this roadmap in the next month of what we are developing, how we validate this and what hypotheses stand behind this.”*

His central hypotheses are concerned with his customers:

- *“Businesses that have already claimed their venue do not have a way of measuring venue performance.*
- *95% of all businesses have not yet claimed their venue because it is too resource intensive and they have not found an automated solution.*
- *Businesses that are on these location-based social networks want to incentivize their customers to interact with their venue within these location-based social networks through discount voucher.”*

These hypotheses have been validated qualitatively through customer interaction and discussion on location-based marketing conferences. Holtschke says that using quantitative measures to validate or better understand these hypotheses is hard as these are very soft topics.

Spotistic makes decisions based on team-discussions and does not always listen to the customer when taking strategic decisions because *“the customer does not know our vision and what could be possible in three years. He wants to have his immediate problem solved but does not know what the solution might be. You should always try to validate everything with metrics but sometimes that is not possible.”*

One assumption regarding the future considers that the importance of local-search optimization will become a very big market similar to search engine optimization. Due to the high purchase intent of users searching for something around them, Holtschke expects this to become a very profitable market. However, he does not know how to validate this and states that *“sometimes you need to take risks”*.

Spotistic currently uses the pirate metrics approach in order to measure activation conversion and retention conversion rates to test the most promising value proposition tagline. They do not concentrate on acquisition and do not invest in SEA heavily as they concentrate on learning and understanding what users like or do not like. Currently, they measure which taglines lead to the highest sign-ups conversion rates.

The most important financial metric for Spotistic is “time-to-run-out” of cash which is calculated by cash divided by monthly burn rate. The implementation of their performance measurement system was developed through discussion with other practitioners, business angels and studying entrepreneurship literature, namely Steve Blank.

In order to advance to the next stage, Holtschke wants to acquire 20 to 30 customers who love his product and are representative of a large potential customer base. Holtschke quotes Paul Graham, the founder of YCombinator, who said regarding the success of Airbnb: *"it is more important to have 100 people who love you than 1,000,000 users who kind of like you."*

In order to measure this, Holtschke wants to use the Sean-Ellis Test as described in chapter 3.5.1.

5.2. Salonmeister

Salonmeister was founded by Phillipp Rechberg, Louis Pfitzner and Nils Griess-Nega in April 2012. They bootstrapped⁶ and went live with their website Salonmeister.de on 31. August 2012. At the beginning, of 2013 the first business angels and the Deutsche Telekom incubator "Hubraum" invested in Salonmeister in a seed-funding round. Nils Griess-Nega is responsible for marketing and processes, Phillip Rechberg is responsible for IT and product development and Louis Pfitzner is responsible for sales, financials and KPIs.

Salonmeister offers a web-based calendar solution for hair salons with the opportunity to book appointments fully electronically through Salonmeister.de or the hair salons' website. Salonmeister wants to improve the very manual and analogical booking process of hair salons. Thus far, in Germany hair appointments are mainly booked through calling the specific hair salon and agreeing on a date which fits both the customer and the hair salon.

A SaaS solution can improve this process for the hair salons that have a mobile and automated calendar which can improve accountability, usability and efficiency. Customers have an easy to use way of finding out when the destined hairdresser is available and compare these times with their own calendar.

Salonmeister's pricing plan is based on the number of employees per salon ranging from 39€ for 1-3 employers, 69€ for 4-7 employees and 99€ for more than 7 employees. Furthermore, Salonmeister charges 4€ per customer booking through the Salonmeister website.

⁶ Bootstrapping means starting a business without external help or capital.

More than one hundred hair salons currently use the SaaS solution provided by Salonmeister. Currently seven employees are working for Salonmeister. These seven consist of the three founders and four sales representatives. Salonmeister plans to employ one additional lead developer and seven interns in the divisions marketing, account management and sales.

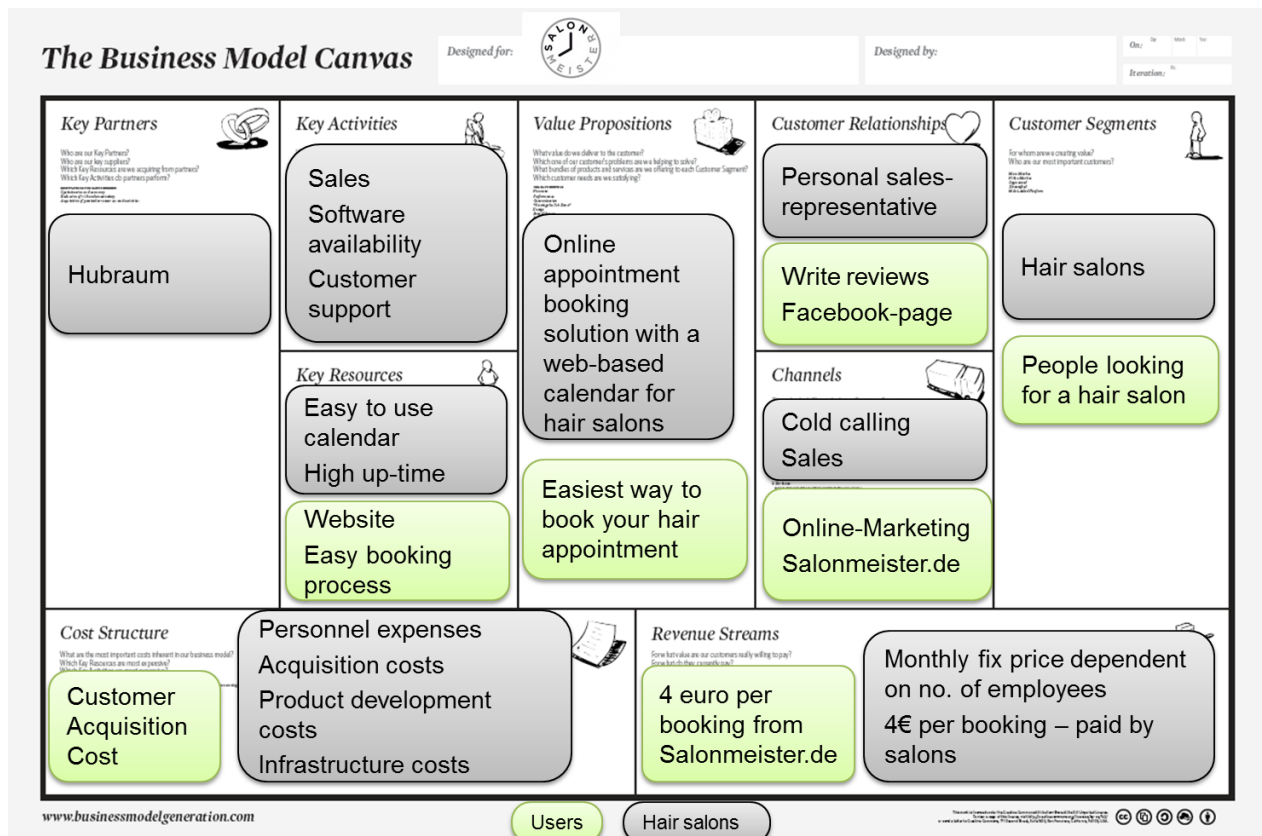


Figure 19: Business model canvas of Salonmeister

Salonmeister has, as shown above, two different customer types and therefore two parts of a business model. First, there are the hair salons they sell the web based calendar with an online booking solution to and second, the users who go to Salonmeister.de and book their appointments from this page.

Salonmeister believes that the more crucial part of the business model is acquiring hair salons. Once there are enough salons on the page, the users will book as it is so comfortable. Therefore, Pfitzner is primarily concerned with metrics concerning these hair salons.

Louis Pfitzner describes performance measures as crucial for almost every business decision. The most important metrics for Salonmeister are: “customer lifetime value, customer acquisition cost and churn rate”. Currently, the calculated customer lifetime

value is higher than the costs needed to acquire the customer, which he identifies as Product/Market fit. However, he cannot guarantee that the churn rate will not go up. Also, especially important for him is the “time to recoup acquisition costs”.

On the user side of the business model, metrics are conversion rates from marketing channels and also retention as the first booking through Salonmeister.de is generally not profitable. Therefore, the user needs to book a second time for Salonmeister to profit from him/her. Pfitzner is convinced that at the moment, this is not a crucial part of the business model. This is emphasized by him saying: *“On a management level when we get together and look at the numbers, we concentrate on the revenue, what it costs and how many bookings we had. We do not look at SEO conversion rates. I am not sure whether Philip is tracking product development metrics or not. I hope he does but we do not discuss them on a management level.”*

In the past, Salonmeister used qualitative responses from its customers to perform a pivot regarding their revenue model. Salonmeister’s previous revenue model was solely based on performance. However, this performance based revenue model was more complicated to explain to the owners of a hair salon. Pfitzner describes this as follows: *“The performance based revenue model is difficult for the sales proposition because owners start to calculate. They then start calculating their number of bookings, guess how many would book online and are therefore not sure how much they have to pay for the service.”*

Salonmeister currently concentrates on acquiring as many new customers as possible and identifying the cheapest channel to do so.

5.3. Analysis

Both founders emphasize the importance of performance measures and their implications for strategic decision making. Spotistic’s founder Holtschke however indicates that for long term decisions, performance measures do not provide enough data and customer perception can be too short-term oriented to generate learnings relevant for long-term strategic decisions. Both case firms apply certain entrepreneurship best practices and are very well aware of the business model concept.

Spotistic concentrates on customer centric measures such as customer retention and acquisition conversion rates as well as customer happiness via the Sean-Ellis Test.

Salonmeister uses customer profitability analysis to track their performance through measuring the customer lifetime value, churn and customer acquisition cost.

The main purely financial metric Salonmeister and Spotistic were concerned with was burn rate and cash which makes up the cash zero date.

It can be concluded that both companies use a customer centric approach to performance measurement but are using very different kind of performance measurement categories. As the business models are rather similar, they cannot explain such drastic differences.

One explanation could be that Spotistic and Salonmeister are in different stages. Spotistic is in the validation stage which means that it has not found its “fit” yet. ,Salonmeister on the other side, is already concerned with acquiring new customers and says that *“most aspects of the business model are validated”*. Salonmeister is currently in the efficiency stage identifying the best acquisition channel. These different stages have an influence on the respective firms. When asked what their current goal is, Holtschke said: “To have a sizable amount of customers that love our product” while Pfitzner said: “To acquire more customers and reduce acquisition cost”.

While Spotistic wants to have 100 customers that love their product, Salonmeister wants to grow and acquire more hair salons. These different objectives lead to different performance measurement systems. The following part will further discuss this and provide a PMS framework for HGNV in their respective stage.

6.PMS for High Growth New Ventures

The analysis conducted in this paper shows a very customer centric approach to performance measurement systems performed by high growth new ventures. New ventures use customer insights to improve or validate certain aspects of their business model.

Furthermore, HGNV are less focused on financial information and primarily use customer satisfaction or product quality measures to measure performance. This is in line with research conducted by Tan and Smyrnios (2011) who interviewed 38 fast growth SME about their use of performance measurement.

Early stage high growth new ventures are interested in only one financial metric - the cash zero date. This metric displays in how many months or days the cash will run out. It is calculated by subtracting the monthly burn rate from current cash.

In the early stages, firms are not focused on generating high profits but their objective is to stay in business. The cash zero date and the burn rate offer valuable information of how much time a business has left until it needs to generate revenue exceeding their current costs or acquire additional funding. This metric has been mentioned by both case firms and three out of four startups of the Expertenworkshop have mentioned the cash zero date, alternatively called "*cash reach*" or "*time to out of cash*".

Entrepreneurship and marketing theory is practically applied by the case study firms and the startups that were part of the "*Expertenworkshop*". Findings indicate that customer profitability analysis through the use of customer lifetime value or customer acquisition costs is used in various startups. Marketing scholars such as Petersen (2013) or Gupta and Zeithaml (2006) have recently criticized the low adoption of customer based accounting measures. Furthermore customer retention (Reinartz, 2005) is an important metric for expected high growth new ventures. Startups also use "*actionable metrics*" as opposed to "*vanity metrics*". Actionable metrics are often used on a per customer basis and techniques like A/B tests are used to support decision making.

Low growth small or medium sized businesses do not use as many customer metrics and their PMS are often not based on best practices from the literature (Cocca and Alberti, 2010; Ates et al., 2013). High growth new ventures are using academic best

practices in their organizations. The absence of strategic performance measures in small businesses due to their lack of formulated strategy has been shown by different researchers (Brem et al., 2008; Garengo and Biazzo, 2012).

The use of visual strategy formulation tools like the business model canvas or customer development process help expected high growth new ventures to visualize and formulate strategy and key success factors. This process improves the PMS design process because strategy and key success factors are the important prerequisites for developing a performance measurement system that drives performance (Hudson Smith and Smith, 2007; Neely et al., 2007; Kaplan and Norton, 2000).

By combining the results drawn from both case studies and the literature review on performance measurement and entrepreneurship, the author discovered differences in the use of performance measurement systems dependent on the size or age of the business. This was also mentioned in the “*Expertenworkshop*”.

“Performance measures are very dependent on the stage of your business. After the first six months, your metrics change and then, after twelve months, they change again.”

Christian Nagel, 2013

The following part will identify the reasons for these different metrics and develop a performance measurement model that depicts the most important measurement cluster for each stage of an HGNV.

In chapter three, it was ascertained that the time it takes to find the fit is different for each new venture. Therefore, a time classification as the basis for the performance measurement model was deemed not appropriate. Instead, the previously presented Marmer stages are used. Marmer et al. (2011) empirically proved that startups, which move through the Marmer stages, grow 20 times faster than inconsistent startups.

This demonstrates a correlation between moving through the Marmer stages and the possibility to become a high growth new venture.

Therefore, the Marmer stages will be used, critical success factors of each stage be identified and the relevant performance measurement framework will be developed.

However, due to the need of close alignment between the venture’s strategy and its performance measures, the developed model will not be able to describe specific metrics. The model should rather elucidate a general framework and describe general tendencies that the HGNV’s stage has on the used performance measures.

Therefore, the performance measurement categories will be defined and illustrated. In order to facilitate comprehension, specific measures are used that have been observed to be of importance for case firms and startups that participated at the “*Expertenworkshop*” or have recently been described in the literature. These specific metrics however cannot be applied to all startups indifferent of their business model and strategy.

This stage model can be used as a guideline for entrepreneurs to determine which group of measures could be of importance in order to achieve their current objective.

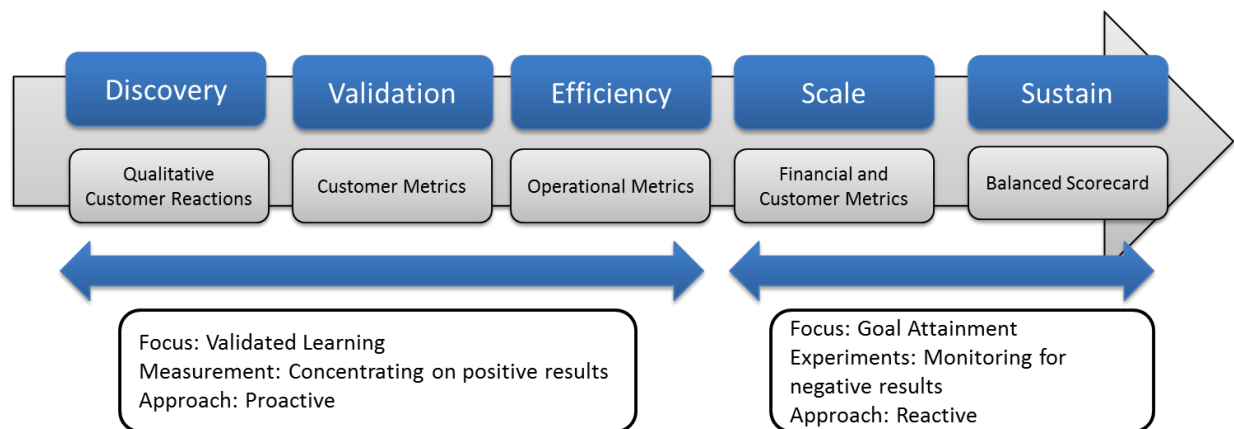


Figure 20: PMS Framework for HGNV (own illustration)

The following part of this chapter will briefly describe the strategies and characteristics of each phase and then concentrate on the use of performance measurement systems.

Discovery

In the discovery stage, the main objective is to discover whether you have identified a problem worth solving (Maurya, 2012). This stage is characterized by high uncertainty about the business model. Most of the building blocks of the business model only contain guesses and are not yet tested or validated.

At this stage, often only the vision exists and no product has been built yet. Therefore, the use of performance measurement systems is limited. However, the use of qualitative interviews and surveys can greatly enhance the understanding of the customers’ problems and solutions.

Ries (2011) advocates measuring performance through validated or falsified hypotheses. This is an integral part of finding the right fit and failure generates most learnings. In order to minimize the cost of eventual failure however only an MVP is used

to gain insights. Figure 21 illustrates the measurement activities of new ventures in the discovery stage

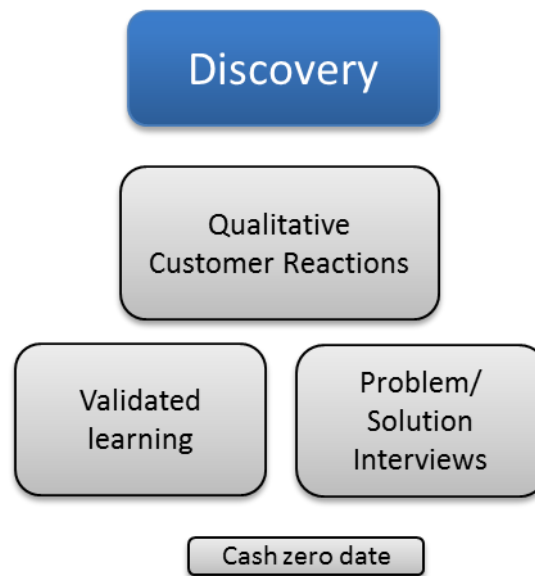


Figure 21: PMS for HGNV in Discovery stage (own illustration)

Because qualitative data is gathered interactively and subject interviewer's bias is a strong concern. Croll and Yoskovitz (2013) say that qualitative metrics are "*easiest to fake*". The "*reality distortion field*" of entrepreneurs, who are very convinced of their product, may ignore criticism and only concentrate on the positive aspects. Furthermore, statistical significance is difficult to accomplish by using qualitative techniques. However, for turning ideas into educated guesses, qualitative metrics can be very helpful.

"If eight out of eight people don't like your product that's pretty significant."

Steve Blank

In the case studies, both founders described that, at a very early stage, they tried to verify basic assumptions such as "*Would someone book a hair appointment online?*" or "*Are firms interested in local marketing?*" through customer interactions.

This is consistent with the processes in the discovery stage of Maurya (2012), Croll & Yoskovitz (2013) and Blank (2012a). These findings do not correlate with the literature review conducted in the PMS research stream since qualitative data has not been the subject of a high amount of research in PMS literature as the very principle of PMS concerns quantifying results.

Validation

The validation phase is concerned with finding product/market fit. Therefore, many experiments and tests like A/B tests or cohorts analysis are conducted to increase learning. These tests compare two alternatives and measure proxies of customer satisfaction to determine which alternative customers like more. These proxies of customer satisfaction are manifold and depend on the business model and “*engine of growth*”. Ries identified three different engines of growth, namely the sticky, the viral and the paid engine of growth. Depending on the business model, metrics from each of these areas can be used as an indicator of customer satisfaction. Figure 22 describes the performance measurement system used by new ventures in the validation stage.

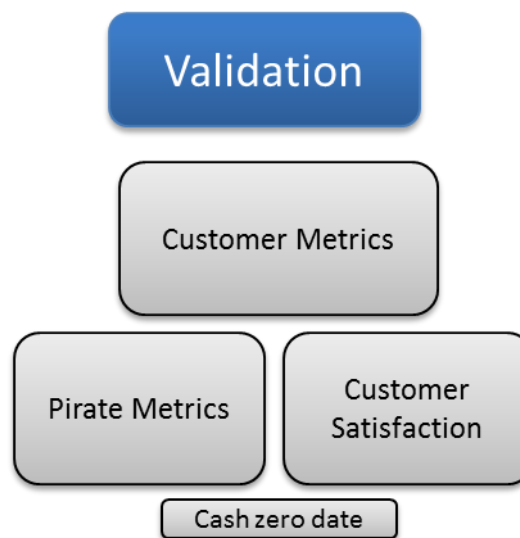


Figure 22: PMS for HGNV in Validation stage (own illustration)

Spotistic, which currently is in the validation stage, is very concerned with the customer performance measures in order to measure the quality of their product. The measures that are particularly important are the conversion rates of retention and activation which are part of the AARRR-funnel (McClure, 2009). Additionally, Holtschke was very focused on customer satisfaction. One of his major goals is to have “*100 customers who love us*”. Besides a typical customer satisfaction questionnaire, Holtschke is using the churn rate - which should be “*close to zero*” - and the Sean-Ellis Test - which asks their customers how they would feel about not being able to use Spotistic’s services anymore – in order to measure customer satisfaction.

In general, it can be observed that customer metrics are especially important in the validation phase but the actual metrics depend on the business model and engine of

growth. Churn rate is very important for startups that use the sticky engine of growth, while viral metrics (*viral coefficient, net promoter score*) are important for startups that chose the viral engine of growth and for startups that chose the paid engine of growth a central metric is *willingness to pay*.

Efficiency

As described by Marmer et al. (2011), after finding Product/Market fit and before the scaling its operations, the new ventures needs to undertake some actions in order to prepare for scaling. At this stage, the focus shifts from effectiveness to efficiency. Drucker (1967) explained the differences between effectiveness and efficiency as follows:

- *Effectiveness is the ability to do the right things.*
- *Efficiency is the ability to do things right.*

The first two stages are concerned with effectiveness. The new venture tries to discover whether it plans to build something that customer's want and would be willing to pay for. So far, the cost of actually developing this have only been outlined in order to gain a basic understanding of whether this could become a profitable business.

The efficiency stage marks a change as now the new venture needs to focus on doing things right which means improving processes and increasing margins. Margins can be increased by reducing costs or increasing revenue. Figure 23 illustrates the performance measurement system used by new ventures in the efficiency stage.

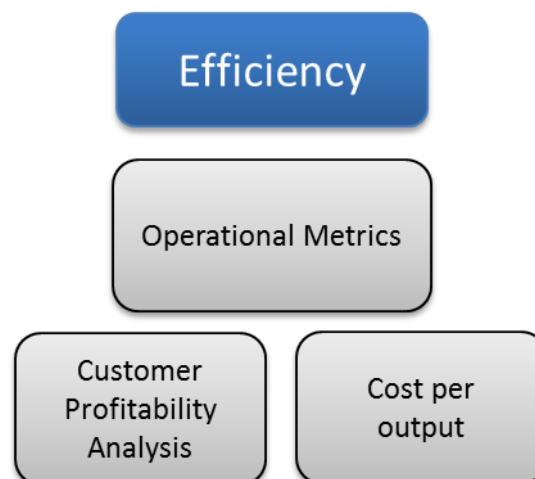


Figure 23: PMS for HGNV in Efficiency stage (own illustration)

The metrics that are important for this stage were previously defined as operational measures. These are especially dependent on the key activities defined in the business model canvas and often include a “cost per output” metric. For example, Salonmeister is currently trying to find a way to reduce acquisition cost because, at the moment, Salonmeister’s key activity is acquiring customers. Salonmeister employs four sales people who cause a significant part of Salonmeister’s expenses. Salonmeister is currently in the efficiency stage and is determining the best way to keep acquisition cost down by comparing different channels. Customer profitability analysis helps managers to gain a forward looking perspective on future cash-flows by comparing the expected CLV with the customer acquisition cost.

One further metric important to Salonmeister is the *“time to recoup acquisition cost”*. The higher this number is, the more risky is the underlying business model. In an uncertain environment, it is very difficult to be certain how long a customer will use a service and therefore companies try to reduce this number.

Scale

After the necessary steps for scaling have been accomplished, the startup “ramps up” its marketing and sales activities for high growth and acquires as many customers as possible. In this stage, the PMS is not solely concentrated on customer metrics but financial metrics are gaining more importance in order to observe results. Figure 24 illustrates the performance measurement system of HGNV in their scale stage.

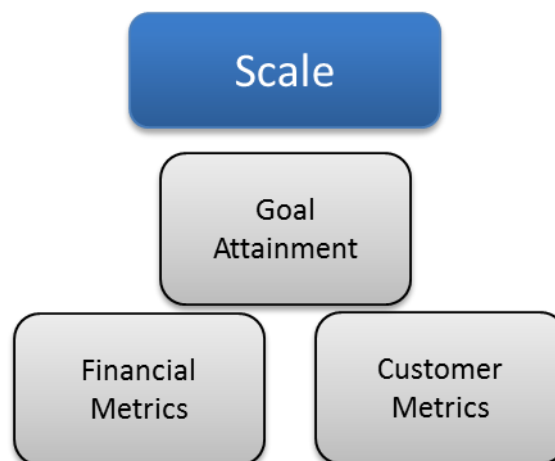


Figure 24: PMS for HGNV in Scale stage (own illustration)

The focus of the PMS is not on learning and innovation but on execution and control. Therefore, budgets are set and individual performance goals can be decided on in order

to motivate the employees. As complexity rises and the venture reaches a certain stage, founders need management systems that support them in leading their organizations.

Performance measurement systems help managers to identify occurred changes which they need to adapt to. Therefore, the use of PMS changed from a tool, proactively used to identify possibilities and validate hypotheses through good results, to a tool that is continuously monitored in order to realize whether everything goes according to plan. In this stage, negative results are more important to observe so that managers can react and identify the reasons underlying these negative results. These different use cases for PMS have been identified by Neely and Al Najjar (2006).

Sustain

The sustain phase marks the point where high growth decreases and the company experiences maturity. The majority of research that has been conducted concerned companies in this stage (Kaplan and Norton, 1992; Neely et al., 2007; Najmi, 2012; Keegan et al., 1989). At this point, the balanced scorecard has proven to be a successful performance measurement system on which basis a company can execute and improve its business model. Figure 25 illustrates the balanced scorecard as the performance measurement systems for companies in the sustain stage.

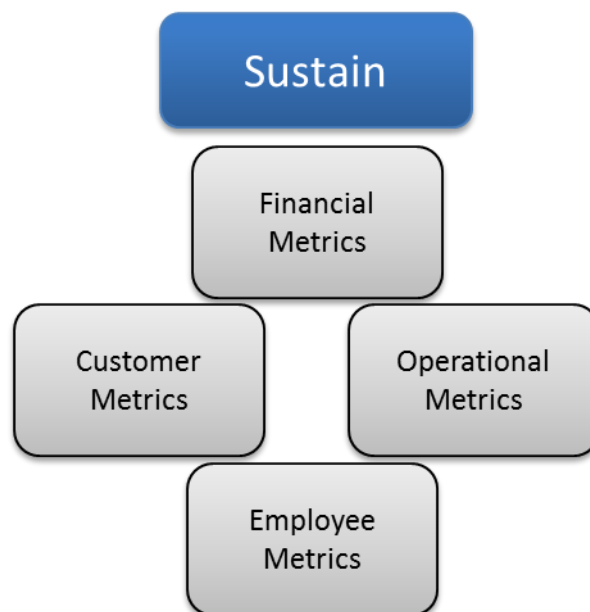


Figure 25: PMS for HGNV in Sustain stage (own illustration)

The balanced scorecard facilitates control and aligns strategy through its goal formulation process. The company meanwhile has a high amount of knowledge about

its customer, its market and its product and is therefore not dependent on validating hypotheses but on measuring goal attainment and identifying problems.

7. Conclusion

This thesis has intended to provide the reader with an overview and a framework on how high growth new firms measure performance in the digital age.

In the first part, the author investigated high growth new ventures concerning their characteristics and economic relevance. It was identified that high growth new ventures, also called gazelles, are very important for economic growth and employment. HGNV challenge the status quo, change the market equilibrium and punish “rent-seekers”, i. e. firms that are unwilling to increase the value of their products for their customers because of the lack of competition. This leads to increased productivity and thus to economic growth.

The author proposed that performance measurement systems can help new ventures to experience high growth and to keep high growth steady. To explore this proposition, the author conducted an analysis regarding the current literature on high growth new ventures. The author found out that the entrepreneurship field has recently been subject to several new revelations. Entrepreneurship scholars that originated from the information system field developed new concepts that changed the perception of entrepreneurship. The business model generation (Osterwalder and Pigneur, 2011) and the customer development process (Blank and Dorf, 2012) changed the way how new ventures are founded and how they conduct business.

New businesses are not concerned with their product and write a business plan which is based on the waterfall product development model but they develop a business model based on a variety of guesses or hypotheses and run experiments to validate or falsify them. This reduces the risk of *“building a product nobody wants”* (Ries, 2011) and increases the knowledge new entrepreneurs have about their customers and their *“pains and gains”*.

The next chapter provided information about the lifecycle a high growth new venture goes through. The author discussed and compared three different models for startups and their implications on the startup’s objectives and strategies. The Marmer stages were deemed appropriate to be used for subsequent analysis because of their empiric foundations and comprehensiveness.

Subsequently, a literature review concerning performance measurement systems was conducted. The evolution of PMS was addressed, different definitions were analyzed and the predominant frameworks were presented and described. Furthermore, a selection of the performance measures, also called metrics, was chosen and presented.

After the literature review was carried out, two case studies were conducted analyzing two expected high growth new ventures in different stages and their use of performance measurement.

With the help of the above mentioned information, the author developed a performance measurement framework for high growth new ventures in their respective stage. This framework should help the entrepreneur to identify the critical success factors for his/her respective stage and use the relevant performance measures to drive success. This framework furthermore adds to the field of startup lifecycle research.

On the basis of the research conducted by Marmer et al. it has been identified that startups that move through these distinct stages experience 20 times faster growth. The framework describes the stages a startup goes through and analyzes the use of performance measurement systems.

The thesis concludes that, in the discovery phase, due to the absence of quantitative data, a startup uses qualitative customer reactions in order to gain knowledge about prospective customers and their problems. The validation phase is very customer centric in terms of performance measurement. In this phase, the founders use a minimum viable product and various tests in order to gain insights into the customer's behavior. Furthermore, they are validating Product/Market Fit through metrics such as customer retention or the Sean-Ellis Test. In the efficiency stage operational measures are of predominant importance. The founder tries to improve the processes of the venture and uses cost per output measures and acquisition channel analysis to reduce cost and prepare for scaling. After the efficiency stage, a PMS is not used as a proactive tool for identifying opportunities and validating hypotheses but it becomes a mainly reactive tool which is regularly monitored for negative observations. A budgeting process is implemented in order to compare PLAN and IS numbers.

In the scale stage, the PMS supports the founders to measure goal attainment. The iterative learning approach has changed to a formalized and planned approach. As described above, the scale stage is characterized by a rapidly changing environment both externally and internally. Customer metrics as well as financial metrics help the

founders to adapt to this changing environment. Due to the high amount of literature for the sustain phase, the author acknowledges the wide acceptance of the balanced Scorecard and incorporates it into his model. The sustain change is similar to the scale stage as it concentrates on goal attainment and control. The environment is changing less rapidly but the large size of the company leads to increased complexity.

The author recognizes that the specific measures used are dependent on the business model, strategy and other factors. However, the author is convinced that going through these stages improves chances for success and that the respective categories are the most relevant categories for most startups at this specific stage.

The author hopes that his framework will assist entrepreneurs in reaching a better understanding about the stages a new venture moves through and how performance measurement systems can assist him/her in moving through these stages.

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9. Appendix

Interview Guide:

1. Seit wann gibt es X?
2. Wie viele Mitarbeiter hat X?
3. In welcher Phase (Marmer) befindet sich X derzeit?
4. Was ist das derzeitige Hauptziel von X?
5. Auf welcher Basis werden bei X Entscheidungen getroffen?
6. Wie wichtig sind Kennzahlen bei der Entscheidungsfindung?
7. Welche Tools nutzt X für die Kennzahlenerhebung?
8. Wie viel Geld wäre X bereit für die Kennzahlenerhebung zu zahlen?
9. Wie wurde das Kennzahlensystem eingeführt?
10. Wurden die KPIs von der Strategie bzw. kritischen Erfolgsfaktoren abgeleitet?
11. Auf welcher Basis wurden die genannten Kennzahlen ausgewählt?
12. Was sind die 10 wichtigsten Kennzahlen von X? Welche von diesen werden zu Entscheidungen herangezogen?
13. Lassen sich diese Kennzahlen in die Bereiche Finanz-, Kunden- und Produktkennzahlen einordnen?
14. Welcher dieser Bereiche ist derzeit für X am wichtigsten?
15. Denkst du, dass die Wichtigkeit der Bereiche sich verändert, wenn X größer wird?
16. Wann würde X sein derzeitiges Kennzahlensystem verändern bzw. neue Kennzahlen hinzufügen?